



**US Army Corps
of Engineers**
Los Angeles District

IFB No. DACW09-91-B-0012

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REPAIR OF ACCESS ROAD

Arizona Canal Diversion Channel (29th Avenue to 47th Drive)

Maricopa County, Arizona

Construction Solicitation and Specifications

May 1991

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Reference: DACW09-91-B-0012-0002

Bid Opening Date: 9 July 1991

U.S. ARMY ENGINEER DISTRICT, LOS ANGELES
P.O. Box 2711
Los Angeles, California 90053-2325

25 June 1991

AMENDMENT NO. 2

I. Specifications, Reference No. DACW09-91-B-0012, covering "Repair of Access Road, Arizona Canal Diversion Channel (29th Avenue to 47th Drive), Maricopa County, Arizona," are modified as follows:

8. SECTION 00010, SOLICITATION, OFFER, AND AWARD (SF 1442).

8.1 Page 1, block 8. Delete the address to send the offers to, and insert:

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
Phoenix Office
3636 N. Central Avenue, Room 760
Phoenix, Arizona 85012-1936

9. SECTION 00800, SPECIAL CLAUSES.

9.1 Page 00800-1, paragraph 1, lines 2 and 3. Delete "within 5 calendar days" and insert: within 1 calendar day

II. This amendment shall be attached to and shall become a part of the specifications.

CHARLES S. THOMAS
Colonel, CE
Commanding

NOTICE: Bidders are required to acknowledge receipt of this amendment on the reverse side of the SF 1442, in the space provided, or by separate letter or telegram prior to opening of bids. Failure to acknowledge all amendments may cause rejection of the bid.


Necessity
Verified

Am. 2
ARMY - C. of E. - Los Angeles

Am. 1

Bid Opening Date: 9 July 1991

U.S. ARMY ENGINEER DISTRICT, LOS ANGELES
P.O. Box 2711
Los Angeles, California 90053-2325

20 June 1991

AMENDMENT NO. 1

I. Specifications, Reference No. DACW09-91-B-0012, covering "Repair of Access Road, Arizona Canal Diversion Channel (29th Avenue to 47th Drive), Maricopa County, Arizona," are modified as follows:

1. SECTION 00100, INSTRUCTIONS TO BIDDERS.

1.1 Page 00100-5, paragraph 15, line 4. Delete "(605) 379-3023" and insert: (602) 379-3023

2. SECTION 00600, REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF BIDDER.

2.1 Page 00600-5. Delete paragraph 11 and insert:

11. CONTRACTOR ESTABLISHMENT CODE (AUG 1989) FAR 52.204-4.

(a) In the block with its name and address, the offeror should supply the Contractor Establishment Code applicable to that name and address, if known, to the offeror. The number should be preceded by "CEC:" Offerors should take care to report the correct CEC and not a similar number assigned to the Offeror in a different system.

(b) The CEC is a 9-digit code assigned to a Contractor establishment that contracts with a Federal executive agency. The CEC system is a Contractor identification coding system which is currently the Dun and Bradstreet Data Universal Numbering System (DUNS). The CEC system is distinct from the Federal Taxpayer Identification Number (TIN) system.

(c) The Government will obtain a Contractor Establishment Code for any awardee that does not have or does not know its CEC.

2.2 Page 00600-11. Delete paragraph 19, 19.1, and 19.2

3. SECTION 00800, SPECIAL CLAUSES.

3.1 Page 00800-4. Delete paragraphs 8 through 8.3 inclusive.

3.2 Page 00800-5. After paragraph 11.3 add:

11.4 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

Am. 1

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.

4. SECTION 01200, GENERAL REQUIREMENTS.

4.1 At the end of the section, after Figure 1, insert the inclosed Figure 1A.

5. SECTION 01250, MEASUREMENT AND PAYMENT.

5.1 Page 01250-1.

5.1.1 Paragraph 2.1, lines 1 through 5. Delete "A survey of * * * greater or less" and insert: The grades and contours prior to commencement of work will be considered to match those indicated on the drawings, and all measurements will be based on these drawings without regard to any changes in the site that may be made between the excavation lines and grades indicated on the drawings or staked in the field and the ground surfaces as indicated. The actual slopes as excavated may be less

5.1.2 At the bottom of the page, delete "1" and insert: 01250-1

6. SECTION 01400, CONTRACTOR'S QUALITY CONTROL.

6.1 Page 01400-1, paragraph 2.3.7, line 1. Delete "or compacted" and insert: or soil is being compacted

7. SECTION 02555, ASPHALT CONCRETE.

7.1 Index. After paragraph 5 add:

6. AGGREGATE GRADATION 02555-2

II. This amendment shall be attached to and shall become a part of the specifications.

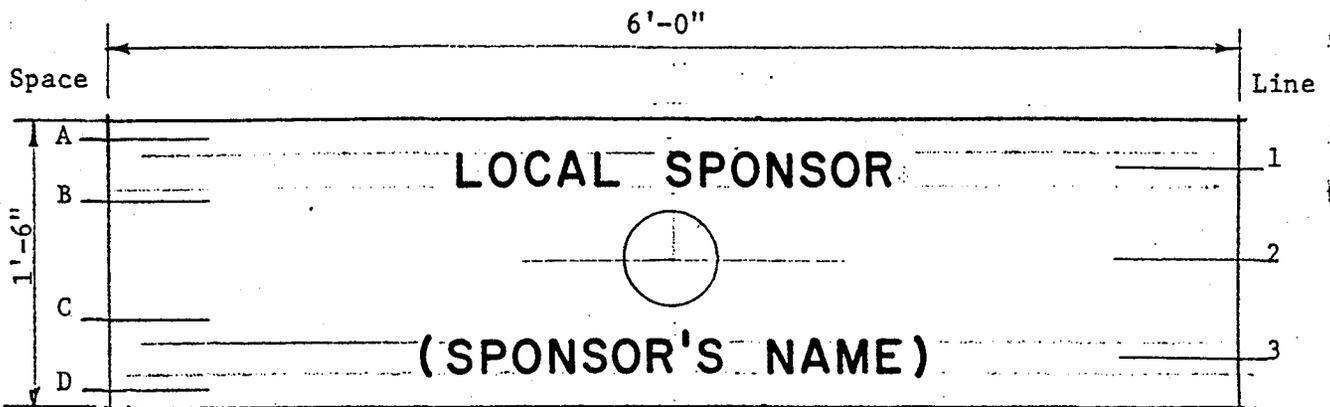
CHARLES S. THOMAS
Colonel, CE
Commanding

Incl.
1. Figure 1A

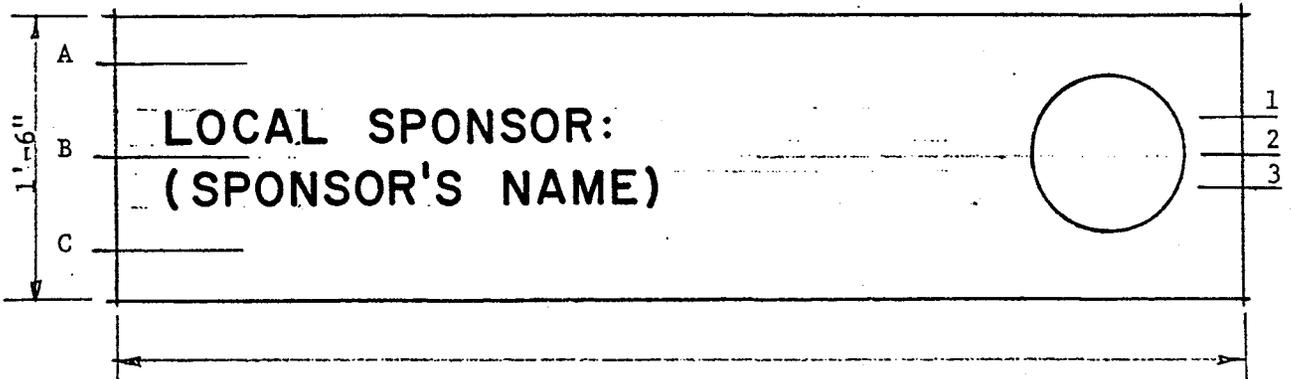
NOTICE: Bidders are required to acknowledge receipt of this amendment on the reverse side of the SF 1442, in the space provided, or by separate letter or telegram prior to opening of bids. Failure to acknowledge all amendments may cause rejection of the bid.

[Handwritten Signature]
Necessity
Verified

Am. 1
ARMY - C. of E. - Los Angeles



<u>Space</u>	<u>Height</u>	<u>Line</u>	<u>Description</u>	<u>Letter Height</u>	<u>Stroke</u>
A	2"				
B	2" Min.	1	LOCAL SPONSOR	2"	3/8"
C	2" Min.	2	SPONSOR'S EMBLEM (DECAL)		
D	2"	3	SPONSOR'S NAME	2"	3/8"



<u>Space</u>	<u>Height</u>	<u>Line</u>	<u>Description</u>	<u>Letter Height</u>	<u>Stroke</u>
A	6"				
B	2"	1	LOCAL SPONSOR	2"	3/8"
C	6"	2	SPONSOR'S EMBLEM (DECAL)		
D	6"	3	SPONSOR'S NAME	2"	3/8"

Lettering Color -- Black

Figure 1A
21 February 1975

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 (Type or print)

20B. SIGNATURE

20C OFFER DATE

AWARD (To be completed by Government)

21. ITEMS ACCEPTED.

22. AMOUNT

23 ACCOUNTING AND APPROPRIATION DATA

24 SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)

ITEM

25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO

10 U.S.C. 2304(c) ()

41 U.S.C. 253(c) ()

26. ADMINISTERED BY

CODE

27. PAYMENT WILL BE MADE BY

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

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

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

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)

31A. NAME OF CONTRACTING OFFICER (Type or print)

30B SIGNATURE

30C DATE

31B UNITED STATES OF AMERICA

31C. AWARD DATE

BY

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)

SECTION 00010

BIDDING SCHEDULE

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Estimated Amount</u>
1.	CLEAR SITE AND REMOVE OBSTRUCTIONS	1	Job	L.S.	\$_____
2.	EXCAVATION	21,000	Cu.Yd.	\$_____	\$_____
3.	COMPACTED FILL	19,000	Cu.Yd.	\$_____	\$_____
4.	ASPHALT CONCRETE PAVEMENT	1,640	Tons	\$_____	\$_____
5.	CURB AND GUTTERS	1	Job	L.S.	\$_____
6.	CONSTRUCTION (REPAIR) AREA N3	1	Job	L.S.	\$_____
7.	CONSTRUCTION (REPAIR) AREA N7	1	Job	L.S.	\$_____
8.	OVERFLOW SPILLWAY NO 6	1	Job	L.S.	\$_____
9.	OVERFLOW SPILLWAY NO 17	1	Job	L.S.	\$_____
10.	LANDSCAPING	1	Job	L.S.	\$_____
TOTAL ESTIMATED AMOUNT					\$_____

NOTES: All extensions of the unit prices shown will be subject to verification by the Government. In case of variation between the unit price and the extension, the unit price will be considered to be the bid.

If a modification to a bid based on unit prices is submitted which provides for a lump sum adjustment to the total estimated costs, the application of the lump sum adjustment to each unit price in the bidding schedule must be stated. If it is not stated, the bidder agrees that the lump sum adjustment shall be applied on a pro rata basis to every unit price in the bidding schedule.

Amounts and prices shall be indicated in either figures or words, not both.

Bids shall be submitted on all items of the Bidding Schedule.

* * * * *

SECTION 00100

INSTRUCTIONS TO BIDDERS

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SECTION 00100

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 (DEC 1989) 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, (3) by letter or telegram, or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids.

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 (DEC 1989) FAR 52.214-5.

4.1 Bids and bid modifications shall be submitted in sealed envelopes or packages (unless submitted by electronic means) (1) addressed to the office specified in the solicitation and (2) showing the time 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.

4.3 Facsimile bids, modifications, or withdrawals, will not be considered unless authorized in the solicitation.

5. DIRECTIONS FOR SUBMITTING BIDS.

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

Bid Under Reference No:
DACW09-91-B-0012

To: U.S. ARMY ENGINEER DISTRICT,
LOS ANGELES
ATTN: Contracting Division
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, 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
Brunswig Square Building, Room 308
360 East Second Street
Los Angeles, California 90013

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 (DEC 1989) 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 if authorized by the solicitation, was sent by telegram or via facsimile, 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, or

7.1.3 Was sent by U.S. Postal Service Express Mail Next Day Service-Post Office To Addressee, not later 5:00 P.M. at the place of mailing two working days prior to the date specified for receipt of bids. The term "working days" excludes weekends and U.S. Federal holidays.

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 both on the envelope or wrapper and on the original receipt from the U.S. or Canadian Postal Service. Both postmarks must show a legible date or 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 clerk to place a legible 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 The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent by U.S. Postal Service Express Mail Next Day Service-Post Office To Addressee is the date entered by the post office receiving clerk on the "Express Mail Next Day Service-Post Office to Addressee" label and both the postmark on the envelope or wrapper and on the original receipt from the U.S. Postal Service. "Postmark" has the same meaning as defined in paragraph 7.3 of this provision, excluding postmarks of the Canadian Postal Service. Therefore, bidders should request the postal clerk to place a legible hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

7.6 Notwithstanding paragraph 7.1 of this provision, 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.

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

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) DFARS 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. 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. Individual copies of EP 1110-1-8 are available from the Government Printing Office (GPO) for \$9.50. To order the publication telephone (202) 783-3228.

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. Neil Erwin or Capt. Stephen Evans, 9601 North 21st Drive, Phoenix, Arizona. Telephone (605) 379-3023.

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 90053-2325. 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. Neil Erwin or Capt. Stephen Evans at telephone (602) 379-3023.

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 711, 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 Maricopa County, 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 sureties 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 prescribed 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 14.406-2.

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:

- (1) Obviously misplaced decimal points will be corrected;
- (2) In case of discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected; and
- (4) 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 (GSBCA), 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, Brunswick 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 GSBCA 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.

23. LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JAN 1990) FAR 52.203-12.

23.1 Definitions.

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

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

- (a) The awarding of any Federal contract.
- (b) The making of any Federal grant.
- (c) The making of any Federal loan.
- (d) The entering into of any cooperative agreement.
- (e) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

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

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

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

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

- (a) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.
- (b) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.
- (c) A special Government employee, as defined in section 202, title 18, United States Code.
- (d) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term

excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

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

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

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

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

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

23.2 Prohibition.

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

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

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

(i) Agency and legislative liaison by own Employees.

(A) The prohibition on the use of appropriated funds, in subparagraph 23.2(b) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision 23.2(c)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

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

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

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

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

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

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

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

(E) Only those services expressly authorized by subdivision 23.2(c)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services by own Employees.

(A) The prohibition on the use of appropriated funds, in subparagraph 23.2(a) of this clause, does not apply in the case of--

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

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

(B) For purposes of subdivision 23.2(c)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

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

(D) Only those services expressly authorized by subdivision 23.2(c)(ii)(A) 1 and 2 of this clause are permitted under this clause.

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

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph 23.2(a) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph 23.2(a) of this clause. An event that materially affects the accuracy of the information reported includes:

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

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

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

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

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

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

(v) Penalties.

(A) Any person who makes an expenditure prohibited under paragraph 23.1 of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph 23.2 of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

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

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

24. PLEDGES OF ASSETS (FEB 1990) FAR 52.228-11.

24.1 Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--

(a) Pledge of assets; and

(b) Standard Form 28, Affidavit of Individual Surety.

24.2 Pledges of assets from each person acting as an individual surety shall be in the form of--

(a) Evidence of an escrow accounting containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government sureties held in book entry form) and/or;

(b) A recorded lien on real estate. The offeror will be required to provide--

(1) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(2) Evidence of the amount due under any encumbrance shown in the evidence of title;

(3) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

25. INDIVIDUAL SURETIES IN SUPPORT OF BIDS. Offerors utilizing individual sureties in support of a bid bond shall include a Standard Form (SF) 28, Affidavit of Individual Surety, accompanied by a pledge of acceptable assets from each person acting as an individual surety, and include these with the SF 24, Bid Bond, and the bid itself in accordance with the paragraph entitled PLEDGE OF ASSETS of the Instructions to Bidders. Pledge of acceptable assets shall be in the form of (1) evidence of an escrow account, and/or (2) a recorded lien on real estate. Failure to provide pledges of acceptable assets, with the bid, in the specified form, accompanied by a properly executed SF 24 and SF 28, will render the offeror nonresponsible, thus ineligible for award.

26. BIDDER'S QUALIFICATION. Before a bid is considered for award, the bidder may be requested by the Government to submit a statement regarding his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the work.

27. PERFORMANCE EVALUATION OF CONTRACTOR.

27.1 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.

27.2 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).

27.3 A similar evaluation for subcontractors will be prepared if the Government deems it to be appropriate.

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SECTION 00600

REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF BIDDER

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SECTION 00600

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 (FEB 1990) FAR 52.219-1.

5.1 Representation. 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.

5.2 Definition. "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.

5.3 Notice. Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small business concern in paragraph 5.1 of this clause in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall (1) be punished by imposition of a fine, imprisonment, or both; (2) be subject to administrative remedies; and (3) be ineligible for participation in programs conducted under the authority of the Act.

6. SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION (DoD FAR SUPPLEMENT DEVIATION) (APR 1990) 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%) unconditionally 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 unconditionally 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 124.109.) This term also means a small business concern that is owned and controlled by an economically disadvantaged Indian tribe or Native Hawaiian Organization and which meets the requirements of 13 CFR 124.112 or 13 CFR 124.113 respectively.

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

- Subcontinent Asian (Asian-Indian) (US Citizen originally from India, Pakistan, Bangladesh, Sri Lanka, or Nepal)
- Asian-Pacific American (US Citizen with origins from Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, or the Federated States of Micronesia)
- 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, including Indian tribes or Native Hawaiian Organizations)
- 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

(c) Certification.

(1) The Offeror represents and certifies, as part of its offer, that it is _____, is not _____ a small disadvantaged business concern.

(2) 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 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.

_____ was found by the SBA not to be socially and economically disadvantaged as a result of the determination but circumstances which caused the determination have changed.

(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) Penalties and Remedies. 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 (i) be punished by imposition of a fine, imprisonment, or both; (ii) be subject to administrative remedies including suspension and disbarment; and (iii) be ineligible for participation in programs conducted under the authority of the Small Business Act.

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 NON-SEGREGATED 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 (SEP 1989) FAR 52.204-3.

(a) Definitions.

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

"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 offeror 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 Federal, 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 (JUL 1990) 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(s) for the performance of work done by the Contractor in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

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

(b) 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 -- no later than thirty (30) calendar days after contract award (unless a longer period is agreed to in writing), for contracts of thirty (30) calendar days or more performance duration, or as soon as possible for contracts of less than thirty (30) calendar days performance duration; but in any case, by a date prior to when performance is expected to be completed--

(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 an ongoing drug-free awareness program to inform such employees about --

- (i) The dangers of drug abuse in the workplace;
 - (ii) The Contractor's policy of maintaining a drug-free workplace;
 - (iii) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- (3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this 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 in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than five (5) calendar days after such conviction;
- (5) Notify the Contracting Officer in writing within ten (10) calendar days after receiving notice under subdivision (b)(4)(ii) of this provision, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee; and
- (6) Within thirty (30) calendar days after receiving notice under subparagraph (b)(4)(ii) of this provision of a conviction take one of the following actions with respect to an employee who is convicted of a drug abuse violation occurring in the workplace:
- (i) Take appropriate personnel action against such employee, up to and including termination; or
 - (ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by 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 paragraphs (b) or (c) 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) or (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 certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

17. 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.

18. 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 Principals--
- (A) Are _____ are not _____ presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;
- (B) Have _____ have not _____, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, 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.

19. CONTRACTOR ESTABLISHMENT CODE (AUG 1989) FAR 52.204-4.

19.1 In the block with its name and address, the offeror should supply the Contractor Establishment Code applicable to that name and address, if known, to the offeror. The number should be preceded by "CEC:" Offerors should take care to report the correct CEC and not a similar number assigned to the Offeror in a different system.

19.2 The CEC is a 9-digit code assigned to a contractor establishment that contracts with a Federal executive agency. The CEC system is a contractor identification coding system which is currently the Dun and Bradstreet Datafication required by paragraph 19.1 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. The certification in paragraph 19.1 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.

20. NOTICE OF RESTRICTIONS ON CONTRACTING WITH SANCTIONED PERSONS (MAY 1989) FAR 52.225-12.

20.1 Statutory prohibitions have been imposed on contracting with sanctioned persons, as specified in Federal Acquisition Regulation (FAR) 52.225-13, Restrictions on Contracting with Sanctioned Persons.

20.2 By submission of this offer, the Offeror represents that no products or services, except those listed in this paragraph 20.2, delivered to the Government under any contract resulting from this solicitation will be products or services of a sanctioned person, as defined in the clause referenced in paragraph 20.1 of this provision, unless one of the exceptions in paragraph (d) of the clause at FAR 52.225-13 applies.

Product or Service

Sanctioned Person

21. CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JAN 1990) FAR 52.203-11.

21.1 The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph 21.2 of this certification.

21.2 The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief as of December 23, 1989 that--

(1) No federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan,

the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement;

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

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

21.3 Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$100,000, for each such failure.

22. HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JUL 1989) EFARS 252.223-7004.

22.1 "Hazardous material", as used in this clause, includes the following:

(1) All items in, or ordinarily cataloged under, the Federal Supply Classes listed in Table I of Appendix A of the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract);

(2) Items having hazardous characteristics in the Federal Supply Classes listed in Table II of Appendix A of the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract);

(3) Any other item to be delivered under this contract which will contain hazardous material or expose Government personnel to those materials.

22.2 Each Offeror shall certify as follows:

The Offeror certifies that the material to be delivered is is not a hazardous material as defined in paragraph 22.1 above.

22.3 The apparently successful Offeror agrees to submit prior to award a Material Safety Data Sheet meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313 in effect on the date of this solicitation for all hazardous material(s) described in paragraph 22.1 above, unless the Offeror certifies in paragraph 22.2 above that the material is not hazardous. Data shall be submitted on all items included in the offer, whether or not the apparently successful Offeror is the actual manufacturer of these items. Failure to comply with this requirement shall result in the Offeror's being considered nonresponsible and ineligible for award.

22.4 If there is a change in the composition of the item(s) after award or a revision to Federal Standard No. 313 which renders incomplete or inaccurate the data submitted under paragraph 22.3 of this clause or the certification submitted under paragraph 22.2 of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

22.5 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.

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

22.7 Notwithstanding any other clause in this contract, the Government's rights in the data furnished under this contract with respect to hazardous material are as follows:

- (1) To use, duplicate, and disclose any data to which this clause is applicable. The purposes of this right are to--
 - (i) Apprise personnel of the hazardous 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 purpose(s).
- (2) That the Government is not precluded from using similar or identical data required from other sources.

23. REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY (SEP 1990) 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

NOTE: THE CERTIFICATE IS ATTACHED AT THE END OF THIS SECTION.

(c)(1) For procurement using sealed bidding procedures, the signed certifications shall be submitted by each bidder with the bid submission except for procurements using two-step sealed bidding procedures (see Subpart 14.5). For those procurements, the certifications shall be submitted with submission of the step two sealed bids. A certificate is not required for indefinite delivery contracts (see Subpart 16.5) unless the total estimated value of all orders eventually to be placed under the contract is expected to exceed \$100,000.

(2) For contracts and contract modifications which include options, a certificate is required when the aggregate value of the contract or contract modification and all options (see 3.104-4(e)) exceeds \$100,000.

(3) Failure of a bidder to submit the signed certificate with its bid shall render the bid nonresponsive.

(d) Pursuant to FAR 3.104-9(d), the Offeror may be requested to execute additional certificates at the request of the Government. Failure of the Offeror to submit the additional certificates shall cause its offer to be rejected.

(e) 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 interests of the Government, such as disqualification of the Offeror.

(f) In making the certification in subparagraph (b)(2) of the certificate, the officer or employee of the competing contractor responsible for the offer may rely upon a one-time certification from each individual required to submit a certification

to the competing contractor, supplemented by periodic training. These certifications shall be maintained by the Contractor for 6 years from the date a certifying employee's employment with the company ends or, for an agent, representative, or consultant, 6 years from the date such individual ceases to act on behalf of the Contractor.

(g) Certifications under paragraphs (b) and (d) of this provision are material representations of fact upon which reliance will be placed in awarding a contract.

* * * * *

CERTIFICATE OF PROCUREMENT INTEGRITY

(1) I, _____ [Name of Certifier], am the officer or employee responsible for this offer and hereby certify, 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), (d), or (f) of the Office of Federal Procurement Policy Act, as amended* (41 U.S.C. 423), (hereinafter referred to as "the Act"), as implemented in the FAR, occurring during the conduct of this procurement (solicitation number).

(2) As required by subsection 27(e)(1)(B) of the Act, I further certify that, to the best of my knowledge and belief, each officer, employee, 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 or possible 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 EXIST) _____

(4) I agree that, if awarded a contract under this solicitation, the certification required by subsection 27(e)(1)(B) of the Act shall be maintained in accordance with paragraph (f) of this provision.

[Signature of the officer or employee responsible for the offer and date]
[Typed name of the officer or employee responsible for the offer]

* The Act became effective on December 1, 1990.

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)

SECTION 00700

INDEX OF CONTRACT CLAUSES

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

This contract incorporates the following clauses (listed on Pages 00700-2 through 00700-6) 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 the following 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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Issued by: Department of the Army, Corps of Engineers
Edition of 10 Aug 90

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SECTION 00750

RATES OF WAGES



GENERAL WAGE DECISION NO. AZ91-2

Supersedes General Wage Decision No. AZ90-2

State: ARIZONA

County(ies): Statewide

Construction
Type: Heavy & Highway

Construction
Description: Heavy & Highway Construction Projects

Modification Record:

No.
1
2

Publication Date
April 5, 1991
May 24, 1991

Page No.(s)
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	Basic Hourly Rates	Fringe Benefits
BRICKLAYERS; Stonemasons:		
Northern Area:		
Zone A	14.95	2.39
Zone B	16.95	2.39
Zone C	17.95	2.39
Zone D	18.45	2.39
Zone E	20.45	2.39
Southern Area:		
Zone A:		
Bricklayers; Stonemasons	13.13	2.62
Manhole Builders	13.43	2.62
Zone B:		
Bricklayers; Stonemasons	13.50	2.62
Manhole Builders	13.80	2.62
Zone C:		
Bricklayers; Stonemasons	13.88	2.62
Manhole Builders	14.18	2.62
Zone D:		
Bricklayers; Stonemasons	14.63	2.62
Manhole Builders	14.93	2.62
*CARPENTERS:		
Carpenters	15.32	3.00
Piledrivermen	15.67	3.00
*DIVERS:		
Zone 1:		
Diver-Wet	40.26	3.00
Stand-by	20.49	3.00
Zone 2:		
Diver-Wet	41.64	3.00
Stand-by	21.87	3.00
*Zone 3:		
Diver-Wet	42.26	3.00
Stand-by	22.49	3.00
Zone 4:		
Diver-Wet	43.26	3.00
Stand-by	24.49	3.00
*MILLWRIGHTS:		
*Zone 1	17.00	3.00
Zone 2	18.38	3.00
Zone 3	19.00	3.00
Zone 4	20.00	3.00
CEMENT MASONS:		
Zone 1:		
Northern Area:		
Cement Masons	18.505	3.05
Concrete Troweling Machine; Sawing and Scoring Machine; Curb and Gutter Machine	18.74	3.05
Central & Southern Areas:		
Cement Masons	16.005	3.05
Concrete Troweling Machine; Sawing and Scoring Machine; Curb and Gutter Machine	16.24	3.05



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Zone 2:	16.445	2.62	
Cement Masons			
Concrete Troweling Machine; Sawing and Scoring Machine; Curb and Gutter Machine; Clary and similar type of power Screed Operator	16.68	2.62	
ELECTRICIANS:			
Area 1:	16.81	1.30+	3.75%
Electricians	18.16	1.30+	3.75%
Cable Splicers			
Area 2:			
Electricians/ Technicians; Cable Spli- cers:	17.10	2.33+	3.5%
Zone A	20.22	2.33+	3.5%
Zone B	18.74	12%+	1.40
Area 3:			
Area 4:			
Electricians on projects having an electrical contract value of less than \$20 million	16.00	2.14+	3%
Electricians on projects having an electrical contract value of \$20 million or more	17.95	2.14+	3%
Area 5:	17.00	1.00+	11.5%
Electricians	17.25	1.00+	11.5%
Cable Splicers			
*IRONWORKERS:			
Northern Area	19.00	5.63	
Southern Area	16.00	5.63	
Central Area	16.00	5.63	
LABORERS:			
Area 1:	13.08	2.77	
Group 1	15.61	2.77	
Group 2	16.19	2.77	
Group 3	16.46	2.77	
Group 4	18.01	2.77	
Group 5			
Barricade Setter:			
Placement, removal, transport, and maintenance of the traffic control devices	5.90	1.27	
Area 2:	10.58	2.77	
Group 1	13.11	2.77	
Group 2	13.69	2.77	
Group 3	13.96	2.77	
Group 4	15.51	2.77	
Group 5			
Barricade Setter:			
Placement, removal, transport, and maintenance of the traffic control devices	5.90	1.27	
(Tunnel and Shaft Work):			
Area 1:	15.985	2.77	
Group 1	16.24	2.77	
Group 2	16.44	2.77	
Group 3	16.98	2.77	
Group 4			



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Group 5	17.295	2.77	
Group 5A	17.655	2.77	
Area: 2			
Group 1	13.485	2.77	
Group 2	13.74	2.77	
Group 3	13.94	2.77	
Group 4	14.48	2.77	
Group 5	14.795	2.77	
Group 5A	15.155	2.77	
*LINE CONSTRUCTION:			
*Zone 1:			
Groundmen	13.95	5.00+	3.75%
Equipment Operator; Powdermen & Mechanics	16.46	5.00+	3.75%
Linemen, Crane Operator, Sagger, and Pilot	20.19	5.00+	3.75%
Cable splicers	20.72	5.00+	3.75%
*Zone 2:			
Groundmen	16.02	4.75+	3.75%
Equipment Operator; Powdermen & Mechanics	18.45	4.75+	3.75%
Linemen, Crane Operator, Sagger, and Pilot	22.24	4.75+	3.75%
Cable splicers	22.87	4.74+	3.75%
PAINTERS:			
Area 1:			
Zone A:			
Brush	11.60	1.90	
Brush, Steel & Bridge	12.10	1.90	
Spray	12.05	1.90	
Spray, Steel & Bridge	12.60	1.90	
Zone B: (\$0.75 per hour above Zone A BHR)			
Zone C: (\$1.75 per hour above Zone A BHR)			
Zone D: (\$2.00 per hour above Zone A BHR)			
Area 2:			
Zone A:			
Brush and Roller; Sandblaster (Nozzlemans); 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; Nozzlemans and Pot Tender; Steel (steam			

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cleaner); Electric and Air Tool Operator; Steel Sandblaster	14.67	1.30
Steel Sandblaster	14.67	1.30
Zone B: (\$1.00 per hour above Zone A (BHR)		
Zone C: (\$2.50 per hour above Zone A BHR)		
Area 3:		
Zone A:		
Brush	12.47	1.77
Spray; Sandblaster	13.07	1.77
Paperhanger	12.60	1.77
Swing Stage, under 40 feet:		
Brush	12.77	1.77
Spray	13.37	1.77
Swing Stage, over 40 feet:		
Brush	13.47	1.77
Spray	14.07	1.77
Structural Steel & Tanks:		
Brush	13.47	1.77
Spray & Sandblasters	14.07	1.77
Creosote Base and Bituminous material	12.87	1.77
Zone B: (\$0.75 per hour above Zone A BHR)		
Zone C: (\$1.50 per hour above Zone A BHR)		
Zone D: (\$2.75 per hour above Zone A BHR)		
PLUMBERS AND PIPEFITTERS:		
Zone 1	17.25	4.73
Zone 2	20.25	4.73
Zone 3:		
Commercial	16.00	3.78
Industrial	19.34	3.78
POWER EQUIPMENT OPERATORS:		
Group 1	12.35	3.28
Group 2	15.10	3.28
Group 3	16.04	3.28
Group 4	16.91	3.28
TRUCK DRIVERS:		
Group 1	7.62	2.87
Group 2	10.82	2.87
Group 3	15.26	2.87
Premium Pay: Combination Man - \$.30 per hr. over highest rated work.		
Multiple-Unit Equipment		

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

AREA DESCRIPTIONS

BRICKLAYERS; STONEMASONS:

Northern Area: Apache, Coconino and Gila Counties; Graham County (west and north of the San Francisco River to the Gila River);



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Greenlee County (west and north of the San Francisco River to the Gila River); Maricopa, Mohave, and Navajo Counties; Pinal County (north of a boundary line drawn west along the Gila River to the western City limits of Florence, a straight line from the extreme southwestern City limits of Florence to the extreme southern City limits of Coolidge, then a straight line to the extreme southern City limits of Casa Grande, with the line extending to the Maricopa/Pinal County Line); Yavapai, Yuma and La Paz Counties:

- Zone A: 0-50 road miles from the City Hall in Phoenix
- Zone B: 50-75 road miles from the City Hall in Phoenix
- Zone C: 75-100 road miles from the City Hall in Phoenix
- Zone D: 100-200 road miles from the City Hall in Phoenix
- Zone E: 200 road miles and over from the City Hall in Phoenix

Southern Area: Cochise County; Graham County (east and south of the San Francisco River to the Gila River); Greenlee County (east and south of the San Francisco River to the Gila River); Pima County; Pinal County (south of a boundary line drawn west along the Gila River to the western City limits of Florence, a straight line from the extreme southwestern City limits of Florence to the extreme southern City limits of Coolidge, then a straight line to the extreme southern City limits of Casa Grande, with the line extending to the Maricopa/Pinal County Line); Santa Cruz Counties:

- Zone A: 0-15 road miles from Tucson City limits
- Zone B: 15-30 road miles from Tucson City limits
- Zone C: 30-40 road miles from Tucson City limits
- Zone D: Over 40 road miles from Tucson City limits

CARPENTERS:

Northern Area: Area north of a straight line drawn between a point 35 miles due north of the City Hall in Flagstaff and a point 35 miles due north of the City Hall in Kingman, extending to the Arizona/Nevada State Line on the west; and connecting to a point 35 miles due north of the City Hall in Holbrook, thence due east to the intersection of the Arizona/New Mexico State Line
Central and Southern Areas: All areas not included in the Northern Area

DIVERS & MILLWRIGHTS:

- Zone 1: 0-30 miles from City Hall in Phoenix or Tucson
- Zone 2: 30-45 miles from City Hall in Phoenix or Tucson
- Zone 3: 45-60 miles from City Hall in Phoenix or Tucson
- Zone 4: over 60 miles from City Hall in Phoenix or Tucson

CEMENT MASONS:

Zone 1: Apache, Coconino, and Gila Counties; Graham County (north of Sentinel-Casa Grande-Safford Line); Greenlee County (north of Sentinel-Casa Grande-Safford Line); Maricopa County (north of Sentinel-Casa Grande-Safford Line); Mohave, and Navajo Counties; Pinal County (north of Sentinel-Casa Grande-Safford Line); Yavapai, Yuma and La Paz Counties:

NORTHERN AREA: Area North of a straight line drawn between a point 35 miles due north of the City Hall in Flagstaff and a point 35 miles due north of the City Hall in Kingman, extending to the Arizona/Nevada State Line on the west and connecting to a point 35 miles due north of the City Hall in



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Holbrook, thence due east to the intersection of the Arizona/
New Mexico State Line.

CENTRAL and SOUTHERN AREAS: All Areas not included in the
NORTHERN AREA

Zone 2: Southern parts of Cochise, Graham, Greenlee, Maricopa, and
Pinal Counties; Pima and Santa Cruz Counties

ELECTRICIANS:

Area 1: Apache County (north of Highway #66)

Area 2: Coconino County; Navajo County (north and west of a boundary
line beginning at a point where Clear Creek crosses the Coconino/
Navajo County Line and then extending in a northeasterly direction
along Clear Creek and northeasterly to Cottonwood Wash, along
Cottonwood Wash extending northeasterly to where it intersects the
Navajo Indian Reservation, then easterly along the Navajo Indian
Reservation boundary line to a point where it intersects the
Navajo/Apache County Line):

Zone A: 5 miles north-south, east and west of the
Post Offices of Williams, Sedona, and Winslow

Zone B: Remainder of Area 2 not covered by Zone A

Area 3: Apache County (south of Highway #66); Gila County; Navajo
County (south and east of a boundary beginning at a point where
Clear Creek crosses the Coconino/Navajo County Line, then extending
in a northeasterly direction along Clear Creek and northeasterly to
Cottonwood Wash, along Cottonwood Wash extending northeasterly to
where it intersects the Navajo Indian Reservation, then easterly
along the Navajo Indian Reservation boundary line to a point where
it intersects the Navajo/Apache County Line); Pinal County (north
of the line, "First Standard Parallel South" and east of the line
"Second Guide Meridian East")

Area 4: Maricopa and Mohave Counties; Pinal County (north and west
of the boundary line beginning at a point where the Papago Indian
Reservation Road #15 crosses the Pima/Pinal County Line, then ex-
tending in a northeasterly direction on the Papago Indian
Reservation Road #15 to the intersection with the Florence Canal,
north and east on the Florence Canal to the intersection with the
line, "Second Guide Meridian East", then north to the Pinal/Maricopa
County Line); Yavapai County

Area 5: Cochise, Graham, Greenlee, and Pima Counties; Pinal County
(south and east of the boundary line beginning at a point where the
Papago Indian Reservation Road #15 crosses the Pima/Pinal County
Line, then extending in a northeasterly direction on the Florence
Canal, north and east on the Florence Canal to the intersection
with the line, "Second Guide Meridian East", then north to the
line, "First Standard Parallel South", and along that line to the
Graham/Pinal County Line); Santa Cruz, Yuma, and La Paz Counties

IRONWORKERS:

Northern Area: The boundaries of the area shall be the Navajo &
Hopi Indian reservations, the City of Page & the Glen Canyon Dam

Southern Area: Cochise, Graham, Pima, Santa Cruz, Yuma & Greenlee
Cos. & those portions of Pinal & Gila Cos. located south of the 33rd
parallel

Central Area: All parts of Arizona not in the Northern or Southern
Areas



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***LINE CONSTRUCTION:**

- Zone 1: Phoenix and Tucson 35 miles radius from the center of Town; Area within 25 mile radius from the City Hall in Yuma
- Zone 2: Other areas not covered by Zone 1.

PAINTERS:

Area 1: Apache, Coconino, Navajo, and Yavapai Counties (north of Woodruff/Camp Wood Line); Mohave County (north of a line following the Geodetic Hualapai Boundary Line to the Colorado River, a distance of 23 miles east of Pierce Ferry and then intersecting the Arizona/Nevada State Line):

- Zone A: 0-20 road miles from Courthouse in Flagstaff
- Zone B: 20-35 road miles from Courthouse in Flagstaff
- Zone C: 35-80 road miles from Courthouse in Flagstaff
- Zone D: 80 road miles and over from Courthouse in Flagstaff

Area 2: Apache, Coconino, Navajo, and Yavapai Counties (south of the Woodruff/Camp Wood Line); Gila, Graham, Greenlee, Maricopa, and Pinal Counties (north of 33rd Parallel); Mohave County (south of a line following the Geodetic Hualapai Boundary Line to the Colorado River, a distance of 23 miles east of Pierce Ferry and then intersecting the Arizona/Nevada State Line):

- Zone A: 0-40 paved road miles from Courthouse in Phoenix; also, Luke and Williams Air Force Bases
- Zone B: 41-60 paved road miles from Courthouse in Phoenix
- Zone C: 61 paved road miles and over from Courthouse in Phoenix

Area 3: Cochise County; Graham, Greenlee, Maricopa and Pinal Counties (south of 33rd Parallel); Pima, Santa Cruz, Yuma, and La Paz Counties:

- Zone A: 0-30 paved road miles from Stone and Congress in Tucson or from the County Courthouse in Yuma
- Zone B: 31-40 paved road miles from Stone and Congress in Tucson or from the County Courthouse in Yuma
- Zone C: 41-50 paved road miles from Stone and Congress in Tucson or from the County Courthouse in Yuma
- Zone D: 51 paved road miles and over from Stone and Congress in Tucson or from the County Courthouse in Yuma

PLUMBERS & PIPEFITTERS

ZONE 1

Base points shall be: Phoenix--the intersection of Central Avenue and Jefferson Street; Flagstaff, Yuma, Kingman, Prescott, Havasu City and Winslow -- the main Post Office building in each city. The "Free Zone" (Zone No. 1) from Phoenix shall be 40 miles from the stated base point. The Free Zone from Flagstaff, Yuma, Kingman, Prescott, Havasu City and Winslow shall be 20 road miles from the stated base point. In addition, all areas within the city limits of Phoenix, Chandler, Scottsdale, Tempe, Glendale, Mesa and Gilbert, as well as that area bordered or encompassed by Apache Trail on the north, Higley Road on the east, Elliott Road on the south and Arizona Avenue on the west, and Sun City



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West will be included as Free Zones. Any work contracted for outside of these Free Zones will be determined from the Phoenix base point.

ZONE 2

Pay Zone shall refer to all jobs outside of the Free Zones listed above.

ZONE 3

Seven Southern Counties of Arizona: Pima, Gila, Pinal, Graham, Greenlee, Santa Cruz, and Cochise

LABORERS:

- Area 1: Area north of a straight line drawn between a point 35 miles due north of the City Hall in Flagstaff and a point 35 miles due north of the City Hall in Kingman, extending to the Arizona/Nevada State Line on the west; and connecting to a point 35 miles due north of the City Hall in Holbrook, thence due east to the intersection of Arizona/New Mexico State Line
- Area 2: All Areas not included in Area 1

GROUP DESCRIPTIONS

LABORERS

- Group 1: Laborer, General or Construction; Tool Dispatcher or Checker; Manually Controlled Signal Operator; Fence Builder; Guard Rail Builder - highway; Chat Box Man; Dumpman and/or Spotter; Rip Rap Stone Man; Rock Slinger; Head Rock Slinger (\$.25); Form Stripper; Packing Rod Steel and Form Stripper; Packing Rod Steel and Pans; Cesspool Diggers and Installers; Astro Turf Layer; Clean Up - Bull Gang Trackman; Railroad Chipper (clearing and grubbing); Kettleman - Tarman; Spikers; Wrenchers - Creosote Tieman; Floor Sanders - Concrete; Sandblaster (Pot Tender); Powderman Tender; Fine Grader; All Tenders not herein separately classified; Window Cleaner Flaggers
- Group 2: Concrete Laborer (belt, pipe and/or Hoseman); Cement Mason Tender; Cutting Torch Operator; Power-type Concrete Buggy; Bander
- Group 3: Chuck Tender (except tunnel); Guinea/Chaser; Operator and Tender of Pneumatic and Electric Tools; Concrete Vibrating Machines, Chain Saw Machines (on clearing and grubbing); Hydraulic Jacks and similar mechanical tools not separately herein classified; Pipe Caulker and/or Backup Man - Pipeline; Rigger and Signal Man - Pipeline; Pipe Wrapper; Cribber; Shorer (except tunnel); Pneumatic Gopher; Pre-cast, Manhole Erector
- Group 4: Asphalt Raker and Ironer; Air and Water Washout Nozzleman (low and high pressure); Scaler (using Bos n's Chair or Safety Belt); Tamper (mechanical - all types); Sandblaster (Nozzleman); Concrete Saw (hand-guided); Concrete Cutting Torch; Gunite (Gunman, Mixerman, Rodman); bio-filter; Pressman; Installer; Operator; Hand-guided Trencher and similarly operated equipment; Driller (Jackhammer and/



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or Pavement Breaker); Grade Setter (pipeline); Pipe Layer (including but not limited to non-metallic transite and plastic pipe, water pipe, sewer pipe, drain pipe, underground tile and conduit)

Group 5: Drill Doctor and/or Air Tool Repairman; Scaler (Driller); Form Setter and/or Builder; Welder and/or Pipe Layer installing process piping; Driller - Core Diamond, Wagon, Air Track, Joy, Mustang, PR-143, 220 Gardner, Denver, Hydrasonic; Powder Man; Water Blaster Operator

(TUNNEL and SHAFT WORK)

Group 1: Bull Gang, Muckers, Trackman; Dumpmen; Concrete Crew (includes Rodders and Spreaders); Grout Crew; Swamper (Brakeman and Switchmen on tunnel work)

Group 2: Nipper; Chucktender, Cabletender; Vibratorman, Jackhammer, Pneumatic Tools (except Driller)

Group 3: Grout Gunman

Group 4: Timberman, Retimberman - wood or steel blaster, Driller, Powderman; Cherry Pickerman; Powderman - Primer House; Steel Form Raiser and Setter; Kemper and other Pneumatic Concrete Placer Operator; Miner - Finisher; Miners - Tunnel (hand or machine)

Group 5: Diamond Drill

Group 5A: Shaft and Raise Miner Welder

POWER EQUIPMENT OPERATORS

Group 1: A Frame Boom Truck, Winch Truck, Air Compressor Operator, Beltorete Operator, Boring Bridge and Texture, Concrete Mixer Operator (skip type), Conductor, Brakeman, Handler, Conveyor Operator, Cross Timing and Pipe Float, Curing Machine Operator, Dinky Operator (under 20 tons), Elevator Hoist Operator (husky and similar), Firemen (all), Forklift and Ross carrier Operator, Generator operator (all), Highline Cableway Signalman, Hydrographic Mulcher, Hydrographic seeder, Joint Insertor, Jumbo Finishing Machine, Kolman Belt Loader Operator, Machine Conveyor Operator, Multiple Power Concrete Saw Operator, Oiler, Pavement Breaker, Power Grizzly Operator, Power Sweeper, Pressure Grout Machine Operator (as used in heavy engineering construction), Pump Operator, Roller Operator (except as otherwise classified), Self-Propelled Chip Spreading Machine, Skiploader (3-1/2 c.y. and less), Slurry Seal Machine Operator (moto paver driver), Small Self-Propelled Compactor (with blade) - backfill, ditch operation, Straw Blower, Tractor Operator (D-5 and under), Tripper Operator, Tugger Operator, Welding Machine Operator, Wheel-Type Tractor Operator (Ford, Ferguson type with attachments, BeeGee etc.)

Group 2: Aggregate Plant Operator (including crushing, screening and sand plants, etc.), Asphalt Plant Mixer Operator, Asphalt Laydown Machine Operator, Backhoe Operator (rubber tire or track less than 1 c.y. MRC), Boring machine Operator, Concrete Batch Plant Operator



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(all types and sizes), Concrete Mechanical Tamping, Spreading or Finishing Machine Operator (including Clary, Johnson or similar types), Concrete Mixer Operator (paving type and mobile mixers), Concrete Pump Operator, Crane Operator (crawler and pneumatic less than 15 ton capacity MRC), Drilling Machine Operator (including water wells), Elevating Grader Operator (all types and sizes, except as otherwise classified), Field Equipment Serviceman, Grade Checker (excluding Civil Engineer), Locomotive Engineer (including Dinky 20 tons weight and over), Moto-Paver (and simmmilar type equipment) Operator, Motor Grader Operator (any type power blade-rough), Oiler Driver, Operating Engineer Rigger, Pneumatio Tired Scraper Operator (all sizes and types), Power Jumbo Form Setter Operator, Road Oil Mixing Machine Operator, Roller Operator (on all types asphalt pavement), Screed Operator, Self-Propelled Compactor (with blade) (815, 825 or equivalent - grade operation), Skip Loader Operator (all types with a rated capacity over 3 1/2 but less than 6 c.y.), Slip Form Operator (power driven lifting device for concrete forms), Soil Cement Road Mixing Machine Operator (single Pass type), Stationary Pipe-Wrapping and Cleaning Machine Operator, Surface Heater and Planer Operator Tractor Operator (dozer, pusher - all), Traveling Pipe-Wrapping Machine Operator, Trenching Machine Operator, Tugger (two or more)

Group 3: 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 Pump Operator (truck mounted, with boom attached), Crane Operator (crawler and pneumatic over 15 tons and less than 100 ton capacity MRC), Crawler-Type Tractor Operator (with boom attachment and slope bar), Derrick Operator, Gradall Operator, Heavy Duty Mechanic/Welder, Helicopter Hoist Operator or Pilot, Highline Cableway Operator, Mass Excavator Operator (150 Bucyrus, Erie and similar type), Mechanical Hoist Operator (two or more drums), Motor Grader Operator (any type power blade-finish), Mucking Machine Operator, Operating Engineers Electrician (including lineman, tower erector, cable splicer, etc.), Overhead Crane Operator, Piledriver Engineer (portable stationary or skid rig), Power Driver Ditch Lining or Ditch Trimming Machine Operator, Remote Control Earth Moving Machine Operator Skip Loader Operator (all types with rated capacity 6 c.y. but less than 10 c.y.), Slip Form Paving Machine Operator (including Gunnert, Zimmerman and similar types), Tower Crane (or similar type), Universal Equipment Operator (shovel, backhoe, dragline, clamshell, etc., up to 10 c.y.),

Group 4: Crane Operator (pneumatic or crawler - 100 ton hoisting capacity and over MRC rating), Skip Loader Operator (all types with rated capicity of 10 c.y. or more), Universal Equipment Operator (shovel, backhoe, dragline, clamshell, etc., 10 c.y. and over)

TRUCK DRIVERS

Group 1: Pickup Driver, Station Wagon Driver, Man Haul Driver, 4 axle or less Dump or Flatrack Driver, Self-propelled street sweeper, tireman, Water Truck Driver, 3800 Gals. and under, Vacuum Pump Truck Driver, Forklift or Fork Truck, Transit Mix Driver, 8 cy or less Mixer capacity, Ambulance Driver with current Red Cross or Bureau/Mines



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First Aid Certificate

Group 2: Transit Mix Driver, over 87 cy, Rock Truck Driver-under 35 tons, Oil Tanker or Spreader Truck Driver and/or Bootman, Retortman or Leverman, 5 axle Dump or Flatrack Driver, Water Truck Driver 3900 gal and over, Off-Highway Equipment Driver including but not limited to: 2 or 4 Wheel Power Unit, i.e., Cat DW Series, Euclid, Int'l and Similar Type Equipment, Transporting Material when top loaded or by External Means, Including Pulling Water Tanks, Fuel Tanks or other applications under Teamster Classification

Group 3: Field Equipment Serviceman or Fuel Truck Driver, Heavy Duty Mechanic/Welder, Transport Driver (Heavy Equipment), Off Highway Rock Truck-35 Tons and over

Combination men shall be paid thirty cents (\$.30) over the highest rated work.

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))

SECTION 00800

SPECIAL CLAUSES

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SECTION 00800

SPECIAL CLAUSES

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 90 calendar days after the date of receipt of notice to proceed. The time stated for completion shall include final cleanup of the premises. The Notice to Proceed will be provided at the same time as the notice of award.

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

2.1 If the Contractor fails to complete the work within the times specified in the contract, or any extensions, the Contractor shall pay to the Government as liquidated damages, the sum of \$500.00 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:

<u>Title</u>	<u>File and Drawing No.</u>
Index to Contract Drawings	252/1022

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 Mar 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 Clauses, 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 or equipment 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. In the case of conflict between the Submittal Register and the Technical Provisions of this contract, the requirements of the Special Clauses shall govern.

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 ten (10) copies of all shop drawings called for by these specifications. One set will be returned to the Contractor.

4.5 Certificates of Compliance. 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 surveys.

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 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 Maricopa County Civil Works Residents Office, 9601 North 21st Drive, Phoenix, Arizona 85021-1805.

6. SALVAGE MATERIALS AND EQUIPMENT (1965 JAN) DFARS 52.236-7005. The Contractor shall maintain adequate property control records for all materials or equipment specified to be salvaged. These records may be in accordance with the Contractor's system of property control, if approved by the property administrator. The Contractor shall be responsible for the adequate storage and protection of all salvaged materials and equipment and shall replace, at no cost to the Government, all salvaged materials and equipment which are broken or damaged during salvage operations as the result of his negligence, or while in his care.

7. LAYOUT OF WORK (APR 1984) FAR 52.236-17.

7.1 The Contractor shall lay out its work from Government established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

8. QUANTITY SURVEYS (APR 1984) FAR 52.236-16.

8.1 Quantity surveys shall be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed and the actual construction completed and in place.

8.2 The Government shall conduct the original and final surveys and make the computations based on them. The Contractor shall conduct the surveys for any periods for which progress payments are requested and shall make the computations based on these surveys. All surveys conducted by the Contractor shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance.

8.3 Promptly upon completing a survey, the Contractor shall furnish the originals of all field notes and all other records relating to the survey or to the layout of the work to the Contracting Officer, who shall use them as necessary to determine the amount of progress payments. The Contractor shall retain copies of all such material furnished to the Contracting Officer.

9. EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (1989 JUL) EFARS 31.105.

9.1 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. For retrospective pricing, the schedule in effect at the time the work was performed shall apply.

9.2 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.

9.3 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.

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

10.1 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.

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:

(a) 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.

(b) The location and dimensions of any changes within the building or structure.

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

(d) Correct elevations if changes were made in site grading.

(e) 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.

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

(g) All changes or modifications which result from the final inspection.

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

11.3 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 blueline 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.

12. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15, 31 Oct 89).

12.1 This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled: DEFAULT (FIXED PRICE CONSTRUCTION). In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipation for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

12.2 The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
10	7	3	1	0	0	2	3	2	2	3	8

12.3 Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in subparagraph 12.2, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract Clause entitled: DEFAULT (FIXED PRICE CONSTRUCTION).

13. ORDER OF PRECEDENCE. Any inconsistency in this solicitation or contract shall be resolved by giving precedence in the following order: (a) the Schedule (excluding the specifications); (b) representations and other instructions; (c) contract clauses; (d) other documents, exhibits, and attachments; and (e) the specifications.

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SECTION 01200

GENERAL REQUIREMENTS

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SECTION 01200

GENERAL REQUIREMENTS

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 (FS).

FS FF-B-575	(Rev C) Bolts, Hexagon and Square
FS FF-N-105	(Rev B; Am 3, Int Am 4) Nails, Brads, Staples and Spikes: Wire, Cut and Wrought
FS FF-N-836	(Rev B; Am 2) Nut, Square, Hexagon, Cap Slotted, Castle, Knurled, Welding and Single Ball Seat
FS MM-L-751	(Rev H) Lumber; Softwood
FS TT-E-529	(Rev G) Enamel, Alkyd, Semi-Gloss
FS TT-P-25	(Rev E; 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 (DOC).

DOC PS 1	(1983) Construction and Industrial Plywood
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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 Six 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.

2.1.4 Bulletin Board at the Contractor's office.

3. CONSTRUCTION SIGNS.

3.1 Materials.

3.1.1 Lumber shall conform to FS 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 DOC PS 1, grade A-C, Group 1, exterior type.

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

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

3.2 Construction.

3.2.1 Project and hard hat signs shall be constructed as detailed on Figures 1, 1A, 2 and 3.

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. 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.

5. 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.

6. 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.

7. SALVAGE MATERIALS. All materials and/or equipment removed and indicated to be either stored or reinstalled are designated as salvaged materials and/or equipment. Any salvaged materials and equipment which are excess upon completion of the work and are not indicated to be stored shall become the property of the Contractor.

8. PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS.

8.1 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 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 utility owner for such damage caused by his operations.

8.2 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 clause of the contract: PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS of the CONTRACT CLAUSES. 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.

8.3 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.

8.4 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.

8.5 Notices.

8.5.1 Traffic Routing. Unless otherwise specified, 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.

8.5.2 Appropriate City and/or County 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.

8.5.3 Utilities To be Relocated or Protected. Unless otherwise specified, 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. The Contractor shall also notify

the following representatives of utility owners not less than 14 days prior to start of work in the vicinity of their respective utilities:

Flood Control District of Maricopa County
3335 West Durango Street
Phoenix, Arizona 85009
Mr Fred Fuller
Telephone: (602) 262-1501

Arizona Public Service
Metro Engineering Service
P.O. Box 21666
2121 W. Cheryl Drive
Phoenix, Arizona 85036
Ms. Lois Winkler
Telephone: (602) 371-6837

Southwest Gas Corporation
9 South 43rd Avenue
Phoenix, Arizona 85072-2075
Mr. Ron Morency
Telephone: (602) 484-5306

Salt River Project
operations - Water
P.O. Box 198Q
Phoenix, Arizona 85001
Mr. Timothy S. Phillips
Telephone: (602) 236-2956

City of Phoenix
Engineering Department
125 E. Washington Street
Phoenix, Arizona 85004
Mr. Dwayne Williams
Telephone: (602) 256-3441

Salt River Project
Electrical
Mr. Chuck Hughes
Telephone: (602) 236-2090

City of Phoenix
Water Department
Mr. Gerald Arakaki
Telephone: (602) 261-8229

Dimensions Cable services
Mr. Blair Tanner
or Mr. John Barnett
Telephone: (602) 866-0072

U.S. West Communications
6350 S. Maple Avenue
Tempe, Arizona 85283
Mr. Curt Sayer
Telephone: (602) 831-4777
or Mr. Robert Friess
2233 W. Dunlap Avenue
Room 205
Phoenix, Arizona 85021
Telephone: (602) 395-2550

8.5.3.1 Staking of Utilities. In addition to notification of representatives of utility owners, the Contractor shall notify the Blue Stakes Center, phone (602) 263-1100, not less than 7 calendar days prior to start of excavation within street right-of-way or, work in the vicinity of known underground utilities, to have underground utilities located and staked.

8.5.4 Permanent Utility Relocations by Others. Except as otherwise specified, 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.

8.5.5 Existing Bench Marks and R/W Markers. The Contractor shall notify the Contracting Officer, in writing, 7 days in advance of the time he proposes to remove any bench mark or right-of-way marker.

8.6 Restrictions.

8.6.1 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.

8.6.2 Work in the area between the south channel right-of-way and the construction easements shown on the drawings shall be subject to the following restrictions:

a. The Contractor shall remove all construction materials placed in this area as a result of its operations under this contract after completion of construction.

b. Convenient passage through the area shall be provided at all times to authorized employees of the Salt River Project.

c. The area may only be used by the Contractor for conveyance of construction equipment and for temporary parking of construction equipment.

d. The Contractor shall provide dust control in accordance with SECTION: ENVIRONMENTAL PROTECTION.

e. The Contractor shall protect permanent features in the area in accordance with the CONTRACT CLAUSE: PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS.

f. The Contractor shall submit a plan of proposed haul roads through the area for approval not less than 14 calendar days prior to start of construction operations. The Contractor will not be permitted to proceed with hauling operations without the prior written approval of the Contracting Officer. The Contractor shall coordinate with all Landowners and Public Entities, for the use of property outside the limits of work under this contract, and shall provide copies of all written agreements to the Contracting Officer, with his plan.

8.6.3 Access to the project will only be permitted from 51st Ave via Arizona Canal Bank, Cactus Ave, 43rd Ave, Peoria Ave, 35th Ave and 29th Ave.

8.6.4 The Contractor will not be permitted to cross existing paved roadways and residential roadways with construction equipment except at approved marked crossings. The Contractor shall maintain the crossings in accordance with applicable state, county, and city regulations.

8.6.5 Pedestrian Bridge. Protected pedestrian access is to be maintained between the pedestrian bridge and the school to the north after 15 August 1991.

8.6.6 Channel. The Contractor is not permitted to use the channel.

9. PUBLIC SAFETY. Attention is directed to the CONTRACT CLAUSE: PERMITS AND RESPONSIBILITIES. The Contractor shall furnish, maintain and remove temporary fencing, barricades, and/or guards, as required, to provide protection in the interest of public safety and in conformance with applicable Federal, State, and local laws and ordinances. As a minimum, this will include an 8-foot chain-link fence which completely encloses each and every part of the projects which the Contractor worked in or is working on. The plan of this temporary fencing shall be furnished to the Contracting Officer for approval and the fence erected prior to commencement of any work. 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. Traffic Control shall conform to the Traffic Barrier Manual, City of Phoenix, and part 400 of the Uniform standard Specifications for Public Works Construction, Maricopa Association of Governments, Arizona.

10. 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.

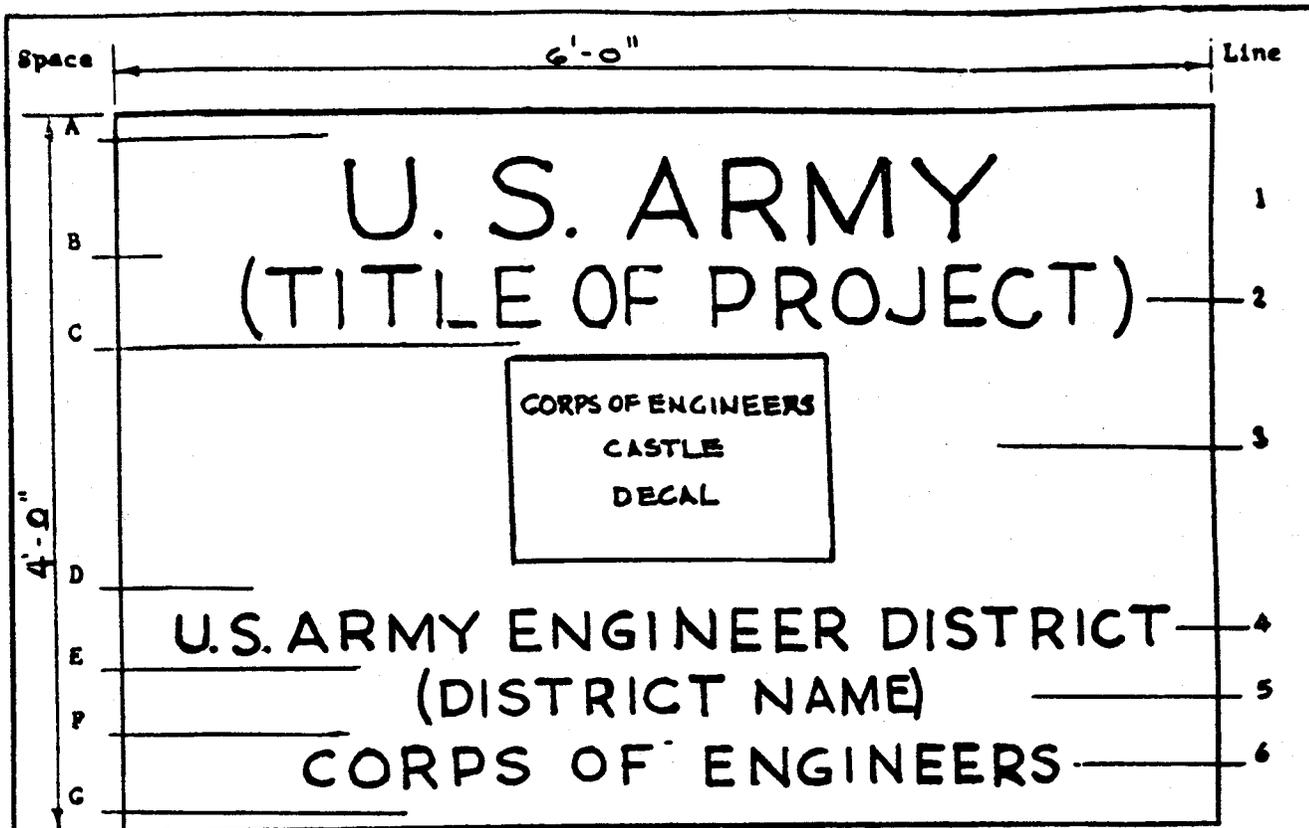
11. PERMITS. Reference is made to the clause of the contract entitled "Permits and Responsibilities," which obligates the Contractor to obtain all required licenses and permits.

12. REQUIRED INSURANCE. The Contractor shall procure and obtain during the entire period of performance under this contract \$1,000,000 General Liability Insurance with the City of Phoenix and the Flood Control District of Maricopa County named as additionally insured.

13. 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.

14. RIGHTS OF WAY DATA. The Government will provide the Contractor with survey data for delineation of the project Rights of Way after issuance of Notice to Proceed.

* * * * *



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

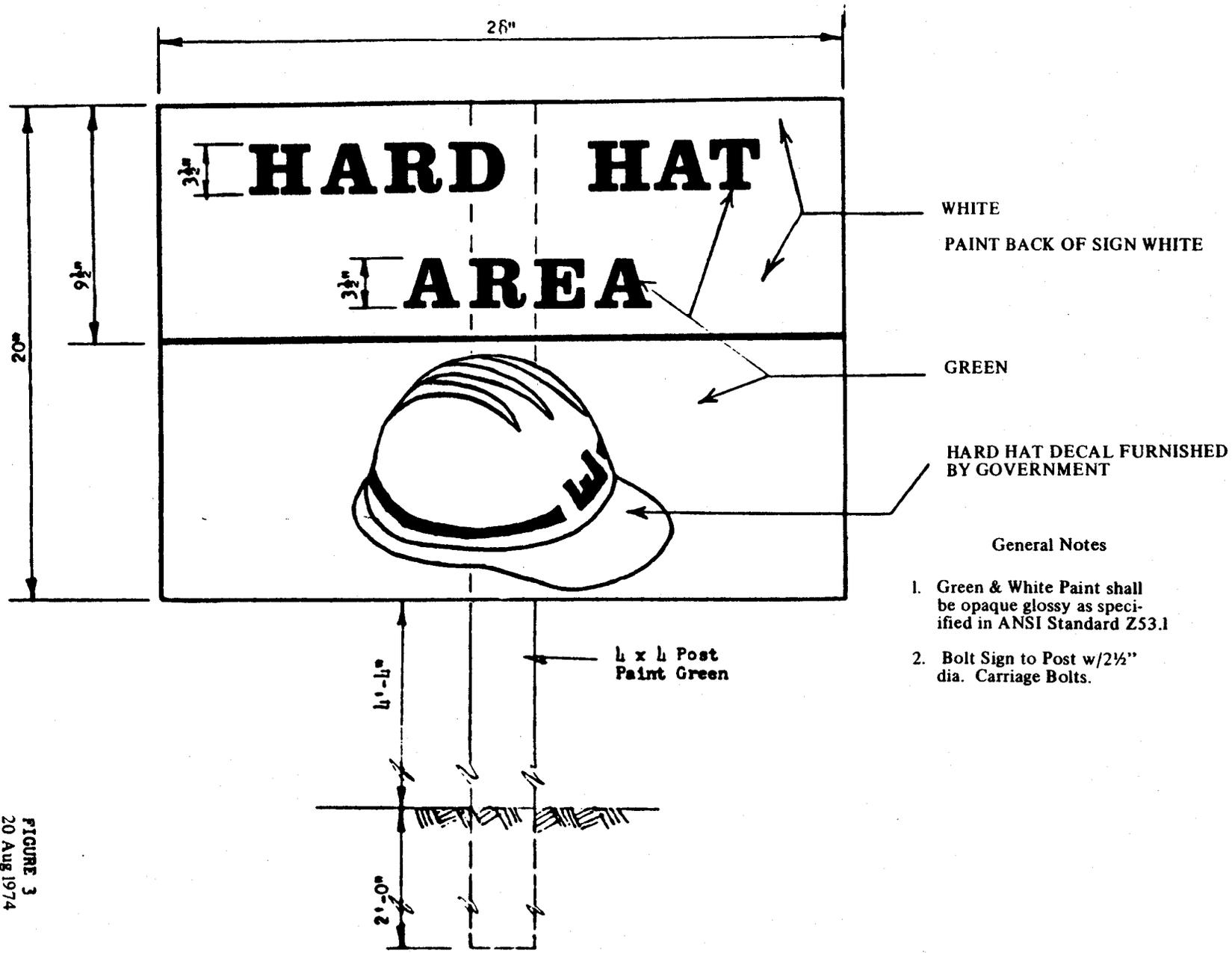


FIGURE 3
20 Aug 1974

SECTION 01250

MEASUREMENT AND PAYMENT

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SECTION 01250

MEASUREMENT AND PAYMENT

1. CLEAR SITE AND REMOVE OBSTRUCTIONS.

1.1 General. Payment shall include all costs for clearing, removal, replacement, and restoration work including all existing obstructions within the rights-of-way. Except as otherwise specified, payment for clearing and removal work includes sawcutting and removal of asphalt concrete paving; removal of spillways, curbs and gutters, grouted stone, slabs, and sidewalks; removal of materials for salvage; protection of utilities, fences, walls, structures, and features indicated to be protected; and disposal of all removed materials.

1.2 Payment for Clear Site and Remove Obstructions will be made at the applicable contract price, which payment shall constitute full compensation for clearing, obstruction removal, and protection work, complete.

2. EXCAVATION.

2.1 Measurement. A survey of the site will be made prior to commencement of work, and all measurements will be based on this survey without regard to any changes in the site that may be made between the excavation lines and grades indicated on the drawings or staked in the field and the ground surfaces as indicated by the above mentioned surveys. The actual slopes as excavated may be greater or less than those indicated or staked, depending on the materials excavated and methods used in performing the work, but such alterations shall not change the measurement for payment from the original lines as specified herein. The quantity of directed excavation necessary for the removal of unsuitable foundation material as specified shall be included in the measurement of the excavation where the unsuitable soils are encountered. Quantities will be computed in cubic yards by the average end area method and the planimeter will be considered a precise instrument for measurement of plotted cross sections. All excavation outside of excavation lines shown on the drawings will be considered as being for convenience of the Contractor.

2.2 Payment for Excavation will be made at the applicable contract price, which payment shall constitute full compensation for excavation (including shoring); shaping and trimming of excavated areas; and loading, hauling, placing and grading into temporary disposal areas. Payment will not be included for construction (repair) areas N3 and N7 and other earthwork requirements for which separate payments are provided.

2.2.1 Subgrade Preparation. No separate payment will be made for subgrade preparation and all costs in connection therewith shall be included in the contract prices for the items to which the work applies.

3. COMPACTED FILL.

3.1 Measurement for payment for compacted fill will be made between the excavation and structure lines and the fill limit lines, or between the ground lines and fill lines, as indicated. Quantities will be computed in cubic yards by the average end area method and the planimeter will be considered a precise instrument for measuring plotted cross sections.

3.2 Payment for Compacted Fill will be made at the applicable contract price, which payment shall constitute full compensation for placing and compacting the fills complete. Payment will not be included for fills at construction (repair) areas N3 and N7 and for other earthwork requirements for which separate payments are provided.

4. ASPHALT CONCRETE PAVEMENT.

4.1 The unit of measurement for the asphalt concrete will be the ton (2,000 lbs.). The Contractor shall weigh each load on a certified platform scale and shall furnish the Contracting Officer with duplicate Weighmaster's Certificates showing the actual net weights. One ticket shall be furnished to the plant inspector and one ticket to the inspector. The bituminous mixture shall be weighed after mixing and no deduction will be made for the weight of bituminous material incorporated therein. Asphalt concrete used for the convenience of the Contractor will not be measured for payment. No measurement will be made for asphalt concrete used in items paid for under lump sum items.

4.2 Payment for Asphalt Concrete Pavement will be made at the applicable contract price, which payment shall constitute full compensation for asphalt concrete in place, including prime coat and weed killer, tack coat, aggregate base coarse, and all incidentals. Payment will not be included for asphalt concrete paid for under lump sum items. No payment will be made for excessive thickness.

5. CURB AND GUTTER. Payment for Curb and Gutter will be made at the applicable contract price, which payment shall constitute full compensation for all labor, material and equipment to construct the curb and gutter, including transitions, subgrade preparation, forming, and finishing, complete. Payment will include the driveway entrance to 35th Avenue including removal of existing curb, gutter and pavement, earthwork, concrete (including cement and steel reinforcement); sidewalks; expansion joints; depressed curbs and all incidentals necessary to match existing street, curb, gutter, and sidewalk. Payment will also include the overflow spillway (No. 20) on the South side of the channel west of 35th Avenue including, preparation of subgrade, furnishing of materials, labor, forming placing and curing. Payment will not be included for curbing and curb and gutter adjacent to overflow spillway No. 6 and construction (repair) areas N3 and N7 for which separate payments are provided.

6. CONSTRUCTION (REPAIR) AREAS. Payment for Construction (Repair) Area N3 and Area N7 will be made at the applicable contract prices, which payments shall constitute full compensation for construction (repair) of the indicated areas including excavation, hauling and disposal of excavated material; placing and compacting fill, asphalt concrete pavement, subgrade preparation, concrete, and curb and gutter; placing and grouting of stone; and replacing and repairing, as necessary, salvaged traffic barrier. Payment will not include removal or replacement of landscaping for which separate payment is provided.

7. OVERFLOW SPILLWAYS. Payment for Overflow Spillway No. 6 and No. 17 will be made at the applicable contract prices, which payments shall constitute full compensation for all materials (including stone, grout and concrete); subgrade preparation, placing and grouting of stone; placing, forming, compaction and curing of transitional curbs. Payment will not include removals, excavation and fill for which separate payment are provided.

8. LANDSCAPING. Payment for Landscaping will be made at the applicable contract price, which payment shall constitute full compensation for all labor, materials, and equipment necessary to protect and maintain the existing plant materials and to furnish and install replacement plants at construction (repair) area N3 as indicated on the drawings. Payment will also include furnishing and installing and/or salvaging paving stones at 35th Avenue as indicated on the drawings;

* * * * *

SECTION 01305

SUBMITTAL PROCEDURES

Index

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SECTION 01305

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL CLASSIFICATION. Submittals are classified as follows:

1.1.1 Government Approved. Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.1.2 Information Only. All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.2 APPROVED SUBMITTALS. The approval of submittals by the Contracting Officer shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract, is responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution is necessary.

1.3 DISAPPROVED SUBMITTALS. The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies as specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, notice as required under the Contract Clause entitled "Changes" shall be given promptly to the Contracting Officer.

1.4 WITHHOLDING OF PAYMENT. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL. The Contractor shall submit all items listed on the Submittal Register (ENG Form 4288) or specified in the other sections of these specifications. The Contracting Officer may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same used in the contract drawings. Submittals shall be made in the respective number of copies and to the respective addresses set forth below. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each respective transmittal form (ENG Form 4025) shall be stamped, signed, and dated by the CQC representative certifying that the accompanying submittal complies with the contract requirements. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including

(but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals including parts list; certifications; warranties and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby.

3.2 SUBMITTAL REGISTER (ENG Form 4288). At the end of this section is one set of ENG Forms 4288 listing each item of equipment and material for which submittals are required by the specifications. Columns "c" thru "o" have been completed by the Government. The Contractor shall complete columns "a," "b," and "p" thru "u" and return 6 completed copies to the Contracting Officer for approval within 15 calendar days after Notice to Proceed for approval. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. This register and the progress schedules shall be coordinated.

3.3 SCHEDULING. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 14 calendar days exclusive of mailing time) shall be allowed on the register for review and approval. No delays damages or time extensions will be allowed for time lost in late submittals.

3.4 TRANSMITTAL FORM (ENG Form 4025). The sample transmittal for (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE. Submittals shall be made as follows:

3.5.1 Deviations. For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS. The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS. Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and date. Four copies of the submittal will be retained by the Contracting Officer and 2 copies of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS. Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. These submittals will be used for information purposes. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the Contracting Office from requiring removal and replacement if nonconforming material is incorporated in the work. This does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS. Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR
(Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s).
SIGNATURE: _____
TITLE: _____
DATE: _____

* * * * *

SUBMITTAL REGISTER														CONTRACT NUMBER.									
TITLE AND LOCATION: Repair of Access Road, Arizona Canal Diversion Channel, Maricopa County, Arizona														CONTRACTOR:				SPECIFICATION SECTION					
NAS ACTIVITY CODE	ITEM NUMBER	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
				S M O P D W G	S A M P L E	G U A R A N T E E	M F G S D A T A	C E R T I F I C A T E	T E S T R E P O R T	T E C H N I C A L D A T A	S O F T W A R E	O T H E R A S N O T E S	I N F O R M A T I O N	G O V E R N M E N T	A P P R O V E D	S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	C O D E	D A T E	S U B M I T T O G O V E R N M E N T	C O D E	
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x
		SECTION 00800, SPECIAL CLAUSES																					
		11.1	As-Built Drawings									X	X										
		SECTION 01200, GENERAL REQUIREMENTS																					
		8.6.2f	Haul Roads									X	X										
		9.	Temporary Fence Plan									X	X										
		SECTION 01400, CONTRACTOR'S QUALITY CONTROL																					
		2.	Contractor Quality Control Plan									X	X										
		SECTION 01430, ENVIRONMENTAL PROTECTION																					
		3.	Environmental Protection Plan									X	X										
		SECTION 02205, FILLS AND SUBGRADE PREPARATION																					
		3.1	Density Tests						X				X										

SUBMITTAL REGISTER														CONTRACT NUMBER									
TITLE AND LOCATION														CONTRACTOR		SPECIFICATION SECTION							
Repair of Access Road, Arizona Canal Diversion Channel, Maricopa County, Arizona																							
NAS ACTIVITY CODE	ITEM NUMBER	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION		REMARKS	
				S H O P D W G	S A M P L E	G U A R A N T E E	M F G S D A T A	C E R T I F I C A T E	T E S T R E P O R T	T E C H N I C A L D A T A	S O F T W A R E	O T H E R A S N O T E D	I N F O R M A T I O N	O N L Y	A P P R O V E D	G O V E R N M E N T	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE		SUBMIT TO GOVERN- MENT
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x
		SECTION 02245, AGGREGATE BASE																					
		3.1	Aggregate Sample			X																	
		3.3	Density Tests						X														
		3.4	Aggregate Source								X												
		SECTION 02250, PRIME COAT AND WEED KILLER																					
		3.3	Bituminous Material						X														
		8.	Weed Killer			XX																	
		9.1	Temperature-Viscosity Relationship									X											
		SECTION 02555, ASPHALT CONCRETE																					
		3.	Aggregates Source								X												
		5.2	Bituminous Material					X															
		5.3.1	Aggregate Gradation						X														
		5.3.2	Determinations						X														
		7.1	Job-Mix Formula								X												

SUBMITTAL REGISTER

CONTRACT NUMBER

TITLE AND LOCATION: **Repair of Access Road, Arizona Canal Diversion Channel,
Maricopa County, Arizona**

CONTRACTOR:

SPECIFICATION SECTION

NAS ACTIVITY CODE	ITEM NUMBER	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CLASSI- FICATION			CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
				S H O P D W G	S A M P L E	G U A R A N T E E	M F G D A T A	C E R T I F I C A T E	T E S T R E P O R T	T E C H N I C A L D A T A	S O F T W A R E	O T H E R A S S U M E D	I N F O R M A T I O N	O N L Y A P P R O V E D	A P P R O V E M E N T	S U B M I T	A P P R O V A L N E E D E D B Y	M A T E R I A L N E E D E D B Y	C O D E	D A T E	S U B M I T T O G O V E R N M E N T	C O D E	D A T E			
a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x			
			SECTION 02560, CONCRETE PAVING STONE																							
		3.1	Material						X																	
		3.2	Laboratory Reports						X																	
			SECTION 02600, STONE PROTECTION																							
		2.2	Stone Sample		X																					
		2.3	Service Records						X																	
		2.6	Grading Curves						X																	
			SECTION 02950, CONCRETE SPILLWAYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAY ENTRANCES																							
		2.1.1	Mixture Proportions									X														
		2.1.2	Cement and Pozzolan					X	X																	
		2.1.3.1	Non-Shrink Grout			X	X																			
		2.1.3.3	Prepackaged Material						X																	
		2.2.1	Accelerating Admixture					X																		
		2.2.2	Impervious Sheet Curing																							
			Material						X																	

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No." This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on re-submittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG Form 4288 for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for Shop Drawings submitted under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications—also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal; letter of transmittal is not required.
8. When a sample of material of Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in section I, column h, to each item submitted. In addition they will ensure inclosures are indicated and attached to the form prior to return to the contractor.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- | | |
|--|---|
| A — Approved as submitted | D — Will be returned by separate correspondence |
| B — Approved, except as noted on drawings.
Resubmission not required. | E — Disapproved (See attached) |
| C — Approved, except as noted on drawings.
Refer to attached sheet resubmission required. | F — Receipt acknowledged |
| | G — Other (Specify) |
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

SECTION 01400

CONTRACTOR'S QUALITY CONTROL

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SECTION 01400

CONTRACTOR'S QUALITY 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.

2.3.7 At anytime when concrete is being placed or compacted, a quality control representative, independent of project supervision, shall be present.

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.

4. SUBMITTALS. Submittals shall be as specified in the SPECIAL CLAUSE entitled "SUBMITTALS". The CQC Organization shall be responsible for the 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 or he may establish an approved testing laboratory at the project site. 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
25 Libertyship Way
Sausalito, Ca 94966

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.

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 by noon of workday following date of report.

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 01430

ENVIRONMENTAL PROTECTION

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SECTION 01430

ENVIRONMENTAL PROTECTION

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, cacti, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archeological 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 ground water 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 nonuse. Plan should include measures for marking the limits of use areas.

(10) Methods for preventing the generation of dust due to construction operations in the work areas, along haul routes, in equipment parking areas, and in waste areas.

3.2 Implementation. After receipt of Notice to proceed, the Contractor shall submit in writing the above Environmental Protection Plan within 14 days. If the Contractor fails to submit an acceptable Environmental Protection Plan within the time herein prescribed, the Contracting Officer may refuse to allow construction to start or may 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. 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 contract 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, cacti, 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 within the construction work limits 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 fenced or flagged. 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, cacti, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by fencing, flagging, 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.

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:

(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 by the Contracting Officer. Due to the sensitive nature of riparian habitat in the basin, strict adherence to the designated areas is necessary. 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 or sediment 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 despoilment.

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 and shall conform to the requirements of applicable local, State and Federal laws and regulations.

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. Crankcase oil and other waste chemicals shall be captured and not drained onto the ground.

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

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

6.2.1 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.

6.2.2 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.

6.3 Protection of Wildlife Resources. The Contractor shall keep construction activities under surveillance, management and control to minimize interference with, disturbance to and damage of wildlife. Species that require specific attention along with measures for their protection will be listed by the Contractor prior to beginning of construction operations.

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, borrow 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 hereinabove to be exceeded or which would cause a hazard or a nuisance. Sprinkling, treatment with an approved non-toxic dust palliative, 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. Construction will not be allowed between the hours of 6:00 p.m. and 7:00 a.m. without the prior written approval of the Contracting officer.

7. RESTORATION OF LANDSCAPE DAMAGE. The Contractor shall restore all landscape features damaged or destroyed during construction operations inside or 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.

8. 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.

9. 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 familiarization with cultural resource identification, and installation and care of facilities to ensure adequate and continuous environmental pollution control.

10. POST CONSTRUCTION CLEAN UP. The Contractor shall clean up all areas used for construction (including haul routes, disposal area) in conformance with CONTRACT CLAUSE: CLEANING UP.

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SECTION 02150

CLEARING SITE AND REMOVING OBSTRUCTIONS

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4. DISPOSAL OF CLEARED, GRUBBED, AND REMOVED MATERIAL	02150-1

SECTION 02150

CLEARING SITE AND REMOVING OBSTRUCTIONS

1. PROTECTION.

1.1 Environmental Protection. All work and Contractor operations shall comply with the requirements of SECTIONS: ENVIRONMENTAL PROTECTION and EXCAVATION.

2. BURNING. The use of burning at the project site for the disposal of refuse and debris will not be permitted.

3. REQUIREMENTS.

3.1 General. Except as otherwise specified, and/or indicated, areas to be cleared will be limited to actual excavation areas, areas to be landscaped, and areas on which fills and/or structures are to be placed. The removal of trees, shrubs, turf, and other vegetation outside of these areas shall be held to a minimum and care shall be exercised not to damage any trees, shrubs, turf, or vegetation which can be left in place.

3.2 Existing Structures and Obstructions. The Contractor shall clear and grub the site, fill, borrow, and excavation areas, and remove and dispose of all existing structures and obstructions for project construction, except as those structures which are identified to be protected in place as shown on the drawings.

4. DISPOSAL OF CLEARED, GRUBBED, AND REMOVED MATERIAL. All material removed, except material specified and/or indicated to be salvaged, is designated as scrap, shall become the property of the Contractor, and shall be removed from the site. Unsuitable materials from clearing operations may be temporarily used for diversion and control of water. Disposal shall be in accordance with the requirements of SECTION: ENVIRONMENTAL PROTECTION.

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SECTION 02200

EXCAVATION

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SECTION 02200

EXCAVATION

1. APPLICABLE PUBLICATIONS. The American Society for Testing and Materials (ASTM) Standard listed below forms a part of this specification to the extent referenced. The publication is referred to in the text by the basic designation only.

ASTM D 2487

(1985) Classification of
Soils for Engineering Purposes

2. GENERAL. Excavation shall consist of the removal of every type of material encountered (except materials covered by the provisions of the SECTION: CLEARING SITE AND REMOVING OBSTRUCTIONS) in the designated areas or from areas directed. The material to be removed may include but is not limited to earth, hardpan, silt, clay, sand, gravel, soft to hard variably cemented alluvium, detached pieces of stone and concrete, rock fills, existing fills of miscellaneous debris and rubbish, and other unsuitable materials. Slope lines indicated on the drawings for temporary cuts do not necessarily represent the actual slope to which the excavation must be made to safely perform the work but do represent the minimum cut required.

3. PRESERVATION OF PROPERTY. All excavation operations shall be conducted in such a manner that street pavements, sidewalks, curbs, utilities, structures, or other facilities and improvements which are to remain in place permanently will not be subjected to settlement or horizontal movement. The Contractor shall furnish and install sheet pilings cribbing, bulkheads, shores or whatever means may be necessary to adequately support material carrying such improvements themselves and shall maintain such means in position until they are no longer needed. Temporary sheet piling, cribbing, bulkheads, shores or other protective means shall remain property of the Contractor and when no longer needed shall be removed from the site. The Contractor shall submit for approval all designs and shop drawings showing proposed method of shoring and bracing which he intends to use. All shoring and bracing shall be designed so that it is effective to the bottom of the excavation, and shall be based upon calculation of pressure exerted by and the condition and nature of the materials to be retained, including surcharge imparted to the side of the trench by equipment and stored materials. Removal of shoring shall be performed in such a manner as not to disturb or damage the finished concrete.

3.1 The following soil parameters shall be used for the design of the temporary sheet piling, cribbing, bulkheads, shores or other protective means:

Wet unit weight	- 130 lbs/ft ³
Angle of internal friction	- 30 degrees
Coefficient of cohesion	- 0 lbs/ft ²

4. EXCAVATION FOR STRUCTURES. Excavation within the vicinity of existing structures, utilities, and drainage pipes to remain in place shall be performed in a manner to prevent damage to the structure. Earth banks and facilities to remain in place shall be supported as necessary during excavation. In general, unless otherwise shown or specified, the actual side slopes shall be in accordance with EM 385-1-1 (Safety Manual).

5. DISPOSAL OF EXCAVATED MATERIALS. Excavated materials suitable for compacted fill shall be placed in temporary stock piles or used directly in the work. All excess excavated material, excavated material not suitable for fills, and unsatisfactory material shall become the property of the Contractor and shall be removed from the site. No excavated material or waste of any kind shall be disposed of at any place beyond the

limits of the work under this contract without express authority. Prior to placing fills in stock piles the site shall be cleared of trash and vegetation. Vegetation shall be cut off at the existing ground line. Clearing shall conform to the applicable requirements of SECTION: CLEARING SITE AND REMOVING OBSTRUCTIONS. Stock piles and disposal fills shall be placed in a manner to preclude the ponding of water.

5.1 Additional requirements for disposal of excess material shall be as specified in the SPECIAL CLAUSES and SECTIONS: GENERAL REQUIREMENTS; ENVIRONMENTAL PROTECTION; and CLEARING SITE AND REMOVING OBSTRUCTIONS.

6. OVERCUT. Except as otherwise specified or as may be ordered in writing, any overcut or excavation made outside the lines indicated on the drawings or directed shall be backfilled with compacted fill conforming to SECTION: FILLS AND SUBGRADE PREPARATION for and all excavating, backfilling, compacting of backfill, and concreting occasioned thereby shall be by the Contractor at no additional cost to the Government.

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SECTION 02205

FILLS AND SUBGRADE PREPARATION

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SECTION 02205

FILLS AND SUBGRADE PREPARATION

1. APPLICABLE PUBLICATIONS. The American Society for Testing and Materials (ASTM) Standards 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.

ASTM D 1556	(1982) Density of Soil In-Place by the Sand-Cone Method
ASTM D 1557	(1978) Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-Lb. (4.54 Kg) Rammer and 18-In. (457 mm) Drop
ASTM D 2216	(1980) Laboratory Determination of Water (Moisture) Content of Soil, Rock and Soil-Aggregate Mixtures
ASTM D 2487	(1985) Classification of Soils for Engineering Purposes

2. COMPACTION EQUIPMENT.

2.1 General. Compaction shall be accomplished by tamping rollers, steel drum rollers or vibratory compactors.

3. GENERAL REQUIREMENTS FOR COMPACTED FILLS.

3.1 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 completed test reports shall be provided with the Contractor Quality Control Report on the work day following the test.

3.1.1 Laboratory Control. One moisture-density relation and companion classification tests shall be made for each classification, blend or change in classification of 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 hereinafter).

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

3.1.1.2 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.

3.1.2 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 at least one test shall be made in each

2 feet of compacted material processed as a unit and at least one test shall be made in each area.

3.1.3 Moisture-Density Curves for Cohesionless and Cohesive Material. Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reversed-shaped moisture-density curves, and cohesive soils may show normal moisture-density curves.

3.2 Settling of fills or backfills with water will not be permitted, except as specified hereinafter for sand fill and filling voids behind walls.

3.3 Material shall be obtained from the required excavations and imported, shall be free from roots, debris, trash or other objectionable material, and shall contain no stone whose greater dimension is more than 3/4 of the layer thickness.

3.4 Placement. Heavy equipment shall not be operated over pipes and buried structures until at least 2 feet of fill material has been placed and compacted over them. Compacted fill and backfill shall be placed with suitable equipment in horizontal layers which after compaction, shall not exceed 12 inches in depth for rubber-tired or vibratory rollers, 6 inches in depth for tamping rollers, and 4 inches in depth when mechanical tampers are used. The Contractor may vary the layer thickness within these limits for most efficient operations. Material containing stones shall be placed in a manner to prevent the stones from striking the concrete structures and to prevent the formation of voids.

3.5 Moisture Content. Material shall have a uniform moisture content while being placed and compacted. Water shall be added at the source, if required, or by sprinkling each layer of material during placement. Uniform distribution of moisture shall be obtained by disking, harrowing, or otherwise manipulating the soil during and after the time water is added. Material containing an excess of moisture shall be manipulated with suitable implements to facilitate maximum aeration and shall be permitted to dry to the proper consistency before being compacted. Fill shall have a maximum moisture content of not more than 3 percent above optimum and a minimum moisture content of not less than 3 percent below optimum.

3.6 Compaction. No layer of fill shall be compacted before the practicable uniform moisture content has been obtained. If the Contractor elects to use rubber-tired or steel drum compaction equipment and the compacted surface of any layer of material is determined by the Contracting Officer to be too smooth to bond properly with succeeding layers, it shall be scarified by a method approved by the Contracting Officer. Scarified areas shall be compacted as specified for the fill placed thereon. Rollers will not be permitted to be operated within one foot of channel or structure walls or over buried structures until the compacted fill over the top of the structures has reached a depth of 2 feet. Compaction equipment shall be so operated that structures are not damaged nor overstressed during compaction operations. Mechanical tampers shall be used for compaction of fill material adjacent to structures where rolling equipment is impracticable for use in compaction.

4. COMPACTED FILL.

4.1 General. Material for compacted fill channel shall be obtained from the required excavations as approved by the Contracting Officer. Additional fill requirements shall be obtained from off site borrow areas for which the Contractor will make all necessary

arrangements including securing all permits for the procurement, furnishing and transporting the import material. Compacted fill may consist of sand, gravelly sand, silty sands, and clayey sands as determined by ASTM D 2487. Organic material, silt, sandy silt, clay, sandy clay, broken concrete or pavement, stone or blocks of cemented alluvium when the greatest dimension is greater than 3 inches, and other objectionable materials shall not be used.

4.2 Limitations on Equipment. The gross weight of any piece of equipment, or the combined weight of any combinations of equipment coupled together, used to place, moisten and/or compact fill behind channel walls shall not exceed 35,000 pounds, including dynamic forces produced by vibratory equipment. Equipment used to compact the fill behind the channel walls shall be of such size as to be capable of operating in the area between the cut slope and the channel wall.

4.3 Compaction. Each layer of fill behind channel walls shall be compacted to not less than 90 percent of maximum density as determined by ASTM D 1557.

5. SUBGRADE PREPARATION.

5.1 Subgrade Approval. No concrete or backfill materials shall be placed on any part of the subgrade until all subgrade preparation and treatment has been completed and such areas have been inspected and approved by the Contracting Officer. Subgrade approval shall be done in sections, the limits of which shall be established by the Contracting Officer in the field.

5.2 Subgrade Preparation for Spillway, Road Pavement, Curbs, Gutters and Driveways. The subgrade shall be alternately watered and scarified until the material is uniformly moistened throughout for a depth of not less than 6 inches. All stones larger than 4 inches in diameter, and hard ribs of earth shall be removed. The amount of water to be applied shall be that which is required to provide optimum results in compaction under rolling. Following the above operations, the subgrade shall be shaped to a true cross section sufficiently higher than the specified grade to allow for subsequent compaction and then be thoroughly compacted to not less than 95 percent of maximum density as determined by ASTM D 1557. After the subgrade has been prepared and completed, the surface shall be firm, hard, and unyielding, with a true, even and uniform surface conforming to the grade and cross section indicated on the drawings. All points of the finished subgrade shall be not more than 1/4 inch below or above true subgrade.

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SECTION 02245

AGGREGATE BASE

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SECTION 02245

AGGREGATE BASE

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 Association of State Highway and Transportation Officials (AASHTO).

AASHTO T 180 (1986) Moisture-Density Relations of Soils Using a 10-lb (4.54 Kg) Rammer and an 18-in. (457 mm) Drop

1.2 American Society for Testing and Materials (ASTM).

ASTM C 117 (1987) Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing

ASTM C 127 (1988) Specific Gravity and Absorption of Coarse Aggregate

ASTM C 128 (1988) Specific Gravity and Absorption of Fine Aggregate

ASTM C 131 (1989) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM C 136 (1984a) Sieve Analysis of Fine and Coarse Aggregates

ASTM D 75 (1987) Sampling Aggregates

ASTM D 422 (1963; R 1972) Particle-Size Analysis of Soils

ASTM D 1556 (1982) Density of Soil In Place by the Sand-Cone Method

ASTM D 1557 (1978) Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.5-kg) Rammer and 18-in. (457-mm) Drop

ASTM D 2216 (1980) Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures

ASTM D 4318 (1984) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

ASTM E 11 (1987) Wire-Cloth Sieves for Testing Purposes

2. MATERIALS. Aggregates shall consist of crushed stone, crushed gravel, angular sand, soil, or other sound, durable, approved materials processed and blended or naturally combined. Aggregates shall be durable and sound, free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign material. It shall be the responsibility of the Contractor to obtain materials that will meet the requirements specified herein and that can be constructed to meet the grade and smoothness requirements specified herein after all compaction requirements have been completed. The material retained on a No. 4 sieve shall be known as coarse aggregate, and the material passing the No. 4 sieve shall be known as binder material.

2.1 Coarse Aggregate conforming to the requirements specified above shall have a percentage of wear not to exceed 50 percent after 500 revolutions. Coarse aggregate shall consist of angular fragments reasonably uniform in density and quality. The amount of flat and elongated particles shall not exceed 30 percent. A flat particle is one having a ratio of width to thickness greater than 3, and an elongated particle is one having a ratio of length to width greater than 3.

2.1.1 Coarse aggregate retained on each sieve specified shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces with the area of each face being at least equal to 75 percent of the smallest midsectional area of the piece. When two fractures are adjacent, the angle between the planes of the fractures must be at least 30 degrees to count as two fractured faces.

2.2 Binder Material shall consist of screenings, angular sand, soil, or other finely divided mineral matter processed or naturally combined with the coarse aggregate. Liquid-limit and plasticity-index requirements stated herein shall apply to any component that is blended to meet the required gradation and shall also apply to the completed course. The portion of any component or of the completed course passing the No. 40 sieve shall be either nonplastic or shall have a liquid limit not greater than 25 and a plasticity index not greater than 5.

2.3 Gradation requirements specified herein shall apply to the completed base course, and it shall be the responsibility of the Contractor to obtain materials that will meet the gradation requirements after mixing, placing, compacting, and other operations. The aggregates shall be continuously graded within the limits specified below:

Sieve Designation	Percentage by Weight Passing Square-Mesh Sieve
1-1/8 inch	100
No. 4	38-65
No. 8	25-60
No. 30	10-40
No. 200	3-12

The values are based on aggregates of uniform specific gravity, and the percentages passing the various sieves are subject to appropriate correction by the Contracting officer when aggregates of varying specific gravities are used.

3. SAMPLING AND TESTING shall be by and at the expense of the Contractor.

3.1 Samples shall be the size required and shall be taken by the Contractor. Copies of test results shall be submitted for approval 7 days prior to starting the work, and thereafter at regular intervals during production as specified hereinafter. These samples shall be obtained at the source, from test pits, borings, trucks, stockpiles, or from other designated locations. Samples for material gradation, liquid-limit determination, and plasticity-index tests shall be taken in conformance with ASTM D 75.

After the material has been placed and compacted, samples for density tests shall be taken as specified in ASTM D 1556, and additional samples for gradation, liquid limit, and plasticity-index tests shall be taken by an appropriate method. Where deemed necessary, the sampling will be supervised by the Contracting Officer. The Contractor shall arrange his work so that sampling and testing may be performed without interruption.

3.2 Tests.

3.2.1 Aggregate Gradation. Aggregate gradation shall be determined in accordance with ASTM C 117, C 127, C 128, C 136, and D 422. Sieves shall conform to ASTM E 11.

3.2.2 Liquid Limit shall be determined in accordance with ASTM D 4318.

3.2.3 Plasticity Index shall be determined in accordance with ASTM D 4318.

3.2.4 Wear Test shall be made in conformance with ASTM C 131.

3.2.5 Field In-Place Density shall be determined in accordance with ASTM D 1556. The Field Moisture content shall be determined in accordance with ASTM D 2216. Moisture-density relations shall be established in the laboratory in accordance with ASTM D 1557 or AASHTO T 180.

3.3 Testing Frequency. Results of tests to determine particle shape, presence of objectionable and foreign matter, percentage of wear, fracture count, gradation, liquid-limit, plasticity-index, specific gravity, and other specification requirements for determination of the acceptability of the source shall be submitted for approval at least 7 days prior to starting of manufacture of the base course material. Production testing for material gradation, liquid limit, and plasticity index shall be performed at regular intervals with at least one test being made for each 500 cubic yards or fraction thereof, of material produced and results shall be submitted on a daily basis. Deviations from specification requirements shall be corrected immediately upon discovery. After the material has been placed and compacted, one field density test for each 1,000 square yards or fraction thereof of finished base course and one additional gradation, liquid-limit, and plasticity index test for each 3,000 square yards of base course or fraction thereof shall be performed. Maximum density-moisture relations shall be established for each 5,000 square yards of base course material. The location of the after-placement tests shall be as directed by the Contracting Officer. One copy of density data (less dry weight determinations) shall be provided on the day each test is taken. The completed test report shall be provided with the Contractor Quality Control Report on the following work day. Results of all tests made shall be submitted for approval on a daily basis and subsequent paving operations shall not commence until final approval has been obtained. Failure of any test shall be reported verbally by the most expeditious means and followed promptly by written report. Contractor field operations shall immediately reflect corrective measures. For every failing test, retesting after completion of corrective measures have been taken will be required.

3.4 Approval of Materials. The source of the material shall be selected 7 days in advance of the time materials will be required in the work. Tentative approval of the preliminary reports submitted by the Contractor and the source will be based on an inspection by the Contracting Officer. Tentative approval of the materials will be based on test samples as specified herein. Final approval of both the source and the materials will be based on specified tests performed on samples taken from the completed and compacted base course.

4. EQUIPMENT. All plant, equipment, and tools used in the performance of the work covered by this section will be subject to approval by the Contracting Officer before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and have the capability of producing the required compaction, meeting grade controls, thickness controls, and smoothness requirements as set forth herein and within the specified time limits.

5. OPERATION OF PITS OR QUARRIES. All work involved in clearing, stripping, and excavating in opening or operation of pits or quarries shall be performed by the Contractor. Pits or quarries shall be opened to expose vertical faces of deposit to depths suitable for working. Materials excavated from pits shall be obtained in successive vertical cuts extending through all exposed strata. All pockets or strata of unsuitable materials overlying or occurring within the deposit shall be wasted as directed. The methods of operating pits or quarries and the processing and blending of the material may be changed or modified by the Contracting Officer when necessary to obtain material conforming to the specified requirements. Quarries shall be conditioned in agreement with the local laws or authorities.

6. WEATHER LIMITATIONS. Aggregate base courses shall be constructed when the atmospheric temperature is above 35 degrees F. When the temperature falls below 35 degrees F. , the Contractor shall protect all areas of the completed aggregate base course, by approved methods, against any detrimental effects of freezing. Areas of completed aggregate base course damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements.

7. PREPARATION OF UNDERLYING SURFACE. Prior to constructing the aggregate base course, the previously constructed subgrade shall be cleaned of all foreign substances. The surface of the subgrade shall be inspected by the Contractor for adequate compaction and surface tolerances. The Contractor shall give the Contracting Officer a 24 hour notice to inspect the subgrade before aggregate base course is placed. The subgrade shall conform to SECTION: FILLS AND SUBGRADE PREPARATION. Ruts or soft, yielding spots that may appear in the subgrade areas having inadequate compaction, and deviations of the surface from the requirements set forth therein shall be corrected to line and grade and to all specification requirements. The finished subgrade shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the base course is placed.

8. GRADE CONTROL. During construction, the lines and grades, including crown and cross slope indicated for the aggregate base course, shall be maintained by means of line and grade stakes placed by the Contractor at the worksite in accordance with paragraph: LAYOUT OF WORK of the GENERAL REQUIREMENTS.

9. MIXING AND PLACING MATERIALS. The materials shall be mixed by the stationary plant, traveling-plant or road-mix method and placed in such a manner as to obtain uniformity of the aggregate base course material and at a uniform optimum moisture content for compaction. The Contractor shall make such adjustments in mixing or placing procedures or in equipment as may be directed to obtain the true grades, to minimize segregation and degradation, to reduce or accelerate loss or increase of water, and to insure a satisfactory aggregate base course meeting all the requirements of this specification.

10. LAYER THICKNESS. The compacted thickness of the aggregate base course shall be as indicated on the drawings and shall be placed in a single layer.

11. **COMPACTION.** The aggregate base course (including shoulders) shall be compacted with approved compaction equipment. Water content shall be maintained at optimum plus or minus 2 percent. In places not accessible to the rollers, the mixture shall be compacted with mechanical tampers. Compaction shall continue until the full depth is compacted to at least 100 percent of maximum density. Unsatisfactory placed materials shall be reworked until they are a satisfactory material. When materials become damaged during placing they shall be removed from the work and disposed of as directed by the Contracting Officer.

12. **EDGES OF BASE COURSE.** Where the course is not placed between curbs or similar construction, approved material shall be placed along the edges of the aggregate base course in such quantities as will compact to the thickness of the course being considered. Allow in each operation at least a 1-foot width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of the base course, as directed.

13. **SMOOTHNESS TEST.** The surface of the course material shall not show any deviations in excess of 3/8 inch when tested with either a 10- or 12-foot straightedge applied both parallel with and at right angles to the centerline of the paved area. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting, as directed.

14. **THICKNESS CONTROL.** The completed thickness of the base course shall be within 1/2 inch, plus or minus, of the thickness indicated. Thickness test shall be made and recorded by the Contractor. The thickness of the base course shall be measured at intervals in such manner that there will be a thickness measurement for at least each 500 square yards of base course. The thickness measurement shall be made by test holes at least 3 inches in diameter through the base course. Where the measured thickness of the base course is more than 1/2 inch deficient in thickness, the Contractor, at no additional expense to the Government, shall correct such areas by scarifying, adding mixture of proper gradation, reblading, and recompacting, as directed. Where the measured thickness of the base course is more than 1/2 inch thicker than that indicated, it shall be considered as conforming with the specified thickness requirements plus 1/2 inch. The average job thickness shall be the average of the job measurements determined as specified above, but shall be within 1/4 inch of the thickness indicated.

15. **MAINTENANCE.** The Contractor shall maintain the aggregate base course in satisfactory condition until the completed work is accepted.

16. **WEIGH BILLS AND DELIVERY TICKETS.** Copies of weigh bills 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 weigh bills and/or certified delivery tickets for all aggregates actually used in the construction covered by the contract.

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SECTION 02550

PRIME COAT AND WEED KILLER

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SECTION 02550

PRIME COAT AND WEED KILLER

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 Society for Testing and Materials (ASTM).

ASTM D 140 (1988) Sampling Bituminous Materials

ASTM D 2027 (1976; R 1986) Cutback Asphalt
(Medium Curing Type)

2. BITUMINOUS MATERIAL. The bituminous material for the prime coat shall be liquid asphalt, conforming to ASTM D 2027, designation MC-70.

3. SAMPLING AND TESTING.

3.1 Sampling. Samples of bituminous material, unless otherwise specified, shall be in accordance with ASTM D 140.

3.2 Testing shall be the responsibility of the Contractor. Testing shall be performed by an acceptable commercial testing laboratory or by the Contractor on approval of the Contracting Officer. Materials shall be tested to establish compliance with the specified requirements.

3.3 Certified Laboratory Test Reports. Before delivery of bituminous materials, certified copies, in triplicate, of the tests specified herein and in referenced publications shall be submitted to and approved by the Contracting Officer. The testing shall have been performed by an independent laboratory approved by the Contracting Officer.

4. QUANTITY TO BE APPLIED. Bituminous material for the prime coat shall be applied in quantities of not less than 0.10 gallon nor more than 0.35 gallon per square yard of the surface to be primed. Application of prime coat shall be divided, if necessary, into 2 applications to avoid flowing off the surface. The exact quantities which may be varied to meet field conditions shall be determined by the Contractor and approved.

5. WEATHER LIMITATIONS. The prime coat shall be applied only when the prepared surface is dry or contains moisture not exceeding quantity to permit uniform distribution and desired penetrations. Prime coat shall be applied only when the ambient temperature is 50 degrees F. or above and the temperature has not been below 35 degrees F. for 12 hours immediately prior to application.

6. EQUIPMENT.

6.1 General. All equipment, tools, and machines, used in the performance of the work required by this section shall be subject to the approval of the Contracting Officer.

6.2 Bituminous Distributor shall have pneumatic tires of such width and number that the load produced on the base surface shall not exceed 650 pounds per inch of tire width. The distributor shall be designed and equipped to distribute the bituminous material uniformly at even heat on variable widths of surface at readily determined

and controlled rates from 0.05 to 2.0 gallons per square yard with a pressure range of 25 to 75 pounds per square inch and with an allowable variation not to exceed 5 percent from any specified rate. Distributor equipment shall include a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating the materials to the proper application temperature, a thermometer to show the temperature of the tank contents, and a hose attachment suitable for applying bituminous material to spots unavoidably missed by the distributor. The distributor shall be equipped to circulate and agitate the bituminous material during the heating process.

6.3 Heating Equipment for Storage Tanks. Equipment for heating bituminous material shall consist of steam coils and equipment for producing steam, so designed that steam cannot get into the material. An armored thermometer with a range from 40 to 200 degrees F. shall be fixed to the tank so that the temperature of the bituminous material may be read at all times.

6.4 Brooms and Blowers shall be of the power type and shall be suitable for cleaning prepared surfaces.

7. PREPARATION OF SURFACE. Immediately before applying the weed killer and prime coat, all loose material, dirt, clay or other objectionable substance shall be removed from the surface by means of a power broom or blower supplemented with hand brooms. After the cleaning operation and prior to the application of the material, an inspection of the area to be treated shall be made by the Contractor to determine the fitness of the area to receive the material. The Contracting Officer shall be notified 24 hours in advance of application of the material. To assure a uniform spread of the material, the areas prepared for treatment, if excessively dry, shall be lightly sprinkled with water immediately before the application as directed.

8. WEED KILLER. A chemical weed killer shall be applied to all areas to receive prime coat prior to application of the prime coat. The weed killer shall be EPA approved pre-emergent herbicide specifically formulated for the intended purpose and suitable for eradicating weed species found in the area. The weed killer shall have demonstrated satisfactory performance for a period of at least 3 years. Application methods and rates shall be as recommended by the manufacturer. The proposed weed killer, application methods and rates shall be submitted to the Contracting Officer for approval.

9. APPLICATION OF BITUMINOUS MATERIAL. Immediately following the preparation of the surface, the bituminous material shall be applied by means of a bituminous distributor. The bituminous material shall be applied at a pressure within the range of 25 to 75 pounds per square inch and in the amounts as directed. The bituminous material shall be so applied that uniform distribution is obtained at all points of the surface to be treated. Unless the distributor is equipped to obtain satisfactory results at the junction of the previous and subsequent application, building paper shall be spread on the surface of applied material for a sufficient distance back from the ends of each application so that flow from the sprays can be started and stopped on the paper, and all sprayers operate at full force on the surface to be treated. Immediately after the application, building paper shall be removed from the site by the Contractor. Spots unavoidably missed by the distributor shall be properly treated with bituminous material. Following the application of bituminous material, the surface shall be allowed to dry without being disturbed for a period of not less than 48 hours, or longer as necessary to attain penetration into the foundation course and evaporation of the volatiles from prime material. The Contractor shall furnish and spread enough approved sand to blot up effectively and cure any excess bituminous material. The Contractor shall maintain the primed surface until the succeeding layer

of pavement is placed by protecting the surface against damage and by repairing and repriming deficient areas at no additional cost to the Government. No smoking, fires, or flames other than heaters that are a part of the equipment shall be permitted in the vicinity of heating, distributing, or transferring operations of bituminous material.

9.1 Application Temperature shall be as directed and shall provide an application viscosity between 40 and 120 centistrokes, kinematic, or 20 and 60 seconds, Saybolt--Furol. Application temperatures shall be between 120-190 degrees F. , except that appropriate changes should be made when the ranges of viscosity are raised or lowered. The temperature-viscosity relationship shall be furnished to the Contracting Officer.

10. WEIGH BILLS AND DELIVERY TICKETS. Copies of weigh bills or delivery tickets shall be submitted during the progress of the work. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified weigh bills and/or certified delivery tickets for all bituminous material actually used in the construction of pavement covered by this section of the specification.

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SECTION 02555

ASPHALT CONCRETE

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SECTION 02555

ASPHALT CONCRETE

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 Society for Testing and Materials (ASTM).

ASTM C 117	(1987) Materials Finer Than No. 200 (75um) Sieve in Mineral Aggregates by Washing
ASTM C 127	(1988) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 136	(1984a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 140	(1988) Sampling Bituminous Materials
ASTM D 242	(1985) Mineral Filler for Bituminous Paving Mixtures
ASTM D 977	(1986) Emulsified Asphalt
ASTM D 1559	(1989) Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
ASTM D 3381	(1983) Viscosity-Graded Asphalt Concrete for Use in Pavement Construction

1.2 Military Standard.

MIL-STD-620	(Rev A; Notice 1) Test Methods for Bituminous Paving Materials
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2. DESCRIPTION. Asphalt concrete indicated as A.C. shall consist of fine and coarse aggregates and mineral filler, if required, uniformly mixed with hot bituminous material, and placed and compacted on a prepared base course subgrade.

3. AGGREGATES shall consist of crushed scone, crushed or uncrushed gravel, screenings, sand, and mineral filler. Aggregates shall have a satisfactory service record in bituminous pavement construction. The source selected shall be approved by the Contracting Officer. Material passing the No. 200 sieve shall be known as mineral filler. Mineral filler shall conform to ASTM D 242. The combined aggregates and mineral filler shall meet the requirements of subsequent paragraphs entitled AGGREGATE GRADATION and COMPOSITION OF MIXTURE.

4. BITUMINOUS MATERIAL.

4.1 Bituminous material to be mixed with the mineral aggregates shall be asphalt cement conforming to ASTM D 3381, Table 2, viscosity Grade AC-20.

4.2 Bituminous material used for the tack coat shall be an asphalt emulsion conforming to the requirements of ASTM D 977, Type SS-1h.

5. SAMPLING AND TESTING.

5.1 Sampling. Samples of bituminous material, unless otherwise specified, shall be in accordance with ASTM D 140.

5.2 Quality Control Testing shall be the responsibility of the Contractor. Testing shall be performed by an acceptable commercial testing laboratory or by the Contractor on approval of the Contracting Officer. Materials shall be tested to establish compliance with the specified requirements. Certificates of compliance shall be furnished.

5.3 Minimum Quality Control Testing. In addition to other tests specified elsewhere, the Contractor is required to perform the following tests on materials as specified hereinafter. At least one set of tests, as described below, shall be completed for each day's placement of asphalt.

5.3.1 Two tests for aggregate gradation for each 500 tons of aggregate produced.

5.3.2 One determination each for stability, flow, voids total mix, and voids filled with bitumen for every 500 tons of AC produced.

6. AGGREGATE GRADATION. Aggregate gradations determined by ASTM C 117 and ASTM C 136 shall conform to the following:

<u>Sieve Opening</u>	<u>Percentage by Weight Passing</u>
1-1/2-inch	100
1-inch	100
3/4-inch	90-100
1/2-inch	75-100
3/8-inch	65-90
No. 4	45-70
No. 8	30-55
No. 30	15-35
No. 200	2-8

7. COMPOSITION OF MIXTURE.

7.1 Job-Mix Formula shall be submitted by the Contractor, and no bituminous mixture shall be manufactured until it has been approved. The formula will indicate the percentage of each sieve fraction of aggregate, percentage of asphalt, and temperature of the mixture as discharged from the mixer. The percentage of asphalt in the job-mix formula, shall be between 5.5 percent and 6.5 percent.

7.2 Test Properties of Bituminous Mixtures. The apparent specific gravity, as determined by ASTM C 127 and C 128, shall be used in computing the voids total mix and voids filled with bitumen, and the mixture shall meet the following requirements as determined by ASTM D 1559:

Test Property	50-Blow Compaction
Stability, minimum, pounds,	500
Flow, maximum, 1/100-inch	20
Voids total mix, percent	3-5
Voids filled with bitumen, percent	75-85

7.3 Retained Stability. If the index of retained stability of the job-mix formula is less than 75 when tested in accordance with Method 104 of MIL-STD-620, the aggregates shall be rejected or treated by one of the following procedures:

a. Addition of heat-stable additives to bitumen.

b. Addition of hydrated lime, or other cementitious material containing free lime, as a portion of the mineral filler.

8. MIXING PLANT shall be a weigh-batch or continuous-mixing type approved by the Contracting Officer and operated so as to produce a mixture within the job-mix formula.

9. OTHER EQUIPMENT.

9.1 Bituminous-Materials Spreaders shall be self-propelled and capable of producing a finished surface conforming to the smoothness requirements specified hereinafter. The use of a spreader that leaves indentations or other objectionable irregularities in the freshly-laid mix will not be permitted.

9.2 Blowers and Brooms shall be of the power type suitable for cleaning the surface to be paved.

9.3 Saws shall be of the power type, capable of rapidly cutting pavement and trimming joints and edges of pavement.

9.4 Small Tools available at the site of the work shall consist of the following: rakes, lutes, shovels, tampers, smoothing irons, pavement cutters, portable heaters for heating small tools, wood sandals and stilt sandals of standard type, and other small tools as may be required.

9.5 Steel-Wheel Rollers shall be self-propelled, 3-wheel (tricycle) and/or tandem type, weighing not less than 20,000 pounds each. The rollers shall have adjustable wheel scrapers, water tanks, and sprinkling apparatus to keep the wheels sufficiently wet to prevent the bituminous mixture from sticking to the wheels. Rollers shall be capable of reversing without backlash and shall be free from worn parts. Roller wheels shall not have flat or pitted areas or projections that will leave marks in the pavement.

9.6 Pneumatic-Tired Rollers shall be self-propelled and shall consist of 2 axles on which are mounted multiple Pneumatic-tired wheels in such a manner that the rear group of wheels will not follow in the tracks of the forward group but spaced to give essentially uniform coverage with each pass. Axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. Tires shall be smooth and capable of being inflated to at least 90 p.s.i. Construction of the roller shall be such that each wheel can be loaded to a minimum of 4,500 pounds.

9.7 All equipment, tools and machines used in the performance of work specified herein shall be subject to approval and shall be maintained in satisfactory working conditions.

10. TREATMENT OF UNDERLYING SURFACE. Prior to laying a bituminous course, the underlying surface shall be cleaned of loose and foreign matter by sweeping with power sweepers, power brooms, and hand brooms, as directed. The surface to be paved shall receive prime coat and weed killer conforming to the requirements of the SECTION: PRIME COAT AND WEED KILLER.

11. TRANSPORTATION OF BITUMINOUS MIXTURE. The bituminous mixture shall be transported from the mixing plant to the site in trucks having tight, clean, smooth bodies with a

minimum coating of concentrated solution of hydrated lime and water to prevent adhesion of the mixture. Each load of mixture shall be covered with canvas or other suitable material to protect the mixture from the weather and to prevent loss of heat. Mixtures having temperatures greater than 350 degrees, mixtures having temperatures less than 235 degrees, or mixtures which form or show indications of moisture will be rejected. Hauling over freshly laid material will not be permitted.

12. PLACING. Contact surfaces of previously constructed pavement, curbs, manholes and other structures shall be sprayed with a thin coat of asphalt conforming to the requirements of paragraph: TACK COAT. The mechanical spreader shall be adjusted and it's speed regulated so that the surface of the course being placed will be smooth and continuous without tears and pulling. The course will be of such depth that after compaction, the cross section, grade, and contour will be as indicated. In areas where the use of machine spreading is impractical, the mixture shall be spread by hand. Unless otherwise directed, placing shall begin on the high side of areas with a one-way slope or along the centerline of areas with a crowned section and shall be in the direction of the main traffic flow. Placing of the mixture shall be as continuous as possible, and the speed of placing shall be adjusted, as directed, to permit proper rolling.

13. COMPACTION OF MIXTURE shall be accomplished by steel-wheel and pneumatic rollers. Rolling shall begin as soon after placing as the mixture will support the roller without undue displacement. Rolling of the course shall be continued until all roller marks are eliminated and at least 95 percent of the density of a laboratory specimen of the same mixture has been obtained. The speed of the rollers at all times shall be slow enough to avoid displacement of the hot mixture. The wheels of the roller shall be moistened to prevent adhesion of the mixture. In areas not accessible to the roller, the mixture shall be compacted with hot hand tampers.

14. TACK COAT.

14.1 Quantities to be Applied. Bituminous materials for the tack coat shall be applied in quantities of not less than 0.02 gallon nor more than 0.15 gallon per square yard. The exact quantities within the range specified may be varied to suit field conditions, shall be determined by the Contractor and approved by the Contracting Officer.

14.2 Equipment. All equipment, tools, and machines used in performance of work required by this section shall be subject to approval and shall be maintained in satisfactory working condition.

14.3 Weather Limitations. Tack coat shall be applied only when the surface to be treated is dry and the temperature shall not have been lower than 35 degrees F. for 12 hours immediately prior to application. It shall not be applied when the atmospheric temperature in the shade is lower than 50 degrees F.

14.4 Preparation of Surface. Immediately before applying the tack coat, all loose material, dirt, clay, or other objectionable material, shall be removed from the surface to be treated with a power broom or blower supplemented with hand brooms. After the cleaning operation, and prior to application of the tack coat, an inspection of the area to be treated will be made by the Contracting Officer to assure fitness of the area to receive the bituminous coating. That portion of surface prepared for immediate treatment shall be dry and in a satisfactory condition.

14.5 Application of Bituminous Material. Immediately following preparation of surface, the bituminous material shall be applied at a temperature within the range of 75 to 130 degrees F. Under no circumstances shall emulsion be heated to a temperature greater than 140 degrees F. or exposed to a temperature of less than 40 degrees F. The bituminous

material shall be applied so uniform distribution is obtained over all points of the surface to be treated. Lightly coated areas and spots missed shall be properly treated with bituminous material. Following application of bituminous material, the surface shall be allowed to dry to a proper condition of tackiness to receive surfacing. The Contractor shall furnish and spread a sufficient quantity of clean, dry sand on all areas that show an excess of bituminous material, to effectively blot up and cure the excess when directed by the Contracting Officer. The treated surface shall be maintained by the Contractor until the succeeding layer of pavement has been placed. During this interval the Contractor shall protect the treated surface against damage and shall repair all damaged spots at no additional cost to the Government.

15. JOINTS. The Joints between old and new pavements or between lanes of new work shall be constructed so as to insure uniform bond, texture, density, and smoothness as in other sections of the course. Edges of existing pavements shall be cut to straight, vertical surfaces. All contact surfaces of existing pavement shall be painted with a thin, uniform coat of tack coat.

16. PROTECTION OF PAVEMENT. After final rolling, no vehicular traffic shall be permitted on the pavement for at least 6 hours after rolling.

17. THICKNESS AND SURFACE REQUIREMENTS.

17.1 Thickness. The finished pavement shall not be more than 1/4 inch less than the thickness specified on the drawings. If the pavement is more than 1/4 inch deficient in thickness, the Contractor shall either (1) remove the entire pavement thickness and replace it or (2) overlay the pavement to bring it to the specified thickness. The minimal allowable overlay shall be not less than 1/2 inch. Edges of overlays that abut gutters or satisfactory pavement shall be milled prior to overlaying to provide a level finished surface. If the Contractor elects to overlay the pavement he will submit a new mix design to the Contracting Officer. This mix design will utilize a maximum nominal aggregate size of 1/4 inch and shall supply the same properties as listed under paragraph: TEST PROPERTIES OF BITUMINOUS MIXTURES, as the original. mixture proposed. This mix design shall be subject to all approvals and requirements of other bituminous mixtures as stated above. No payment will, be made, for excessive thickness.

17.2 The finished surface shall not vary more than 1/4 inch from a 10 foot straightedge. The straightedge shall be furnished by the Contractor. Defective areas shall be corrected by the Contractor at no additional cost to the Government.

18. SAMPLING. Sampling for the determination of thickness and density of the completed pavements will be performed by the Contracting Officer. All other tests necessary to determine conformance with the specified requirements will be performed by the Contractor. The Contractor shall replace the pavement where samples are removed, at his expense. No payment will be made for areas of pavement deficient in composition, density, or thickness until they are removed and replaced by the Contractor as directed by the Contracting Officer.

19. WEIGH BILLS AND DELIVERY TICKETS. Copies of weigh bills or delivery tickets for asphalt concrete shall be submitted during the progress of the work. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified weigh bills and/or certified delivery tickets for all material used in the construction of the pavement covered by this section of the specifications.

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SECTION 02560

CONCRETE PAVING STONE

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SECTION 02560

CONCRETE PAVING STONE

1. APPLICABLE PUBLICATIONS. The American Society for 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.

ASTM C 33 (1990) Concrete Aggregates

ASTM C 936 (1982; R 1988) Solid Concrete Interlocking Paving Units

2. GENERAL. Paving units shall be precast interlocking paving units salvaged from the existing site. Additional units must be produced by a manufacturer regularly engaged in the manufacture of paving units conforming to the requirements specified herein. The Contractor, selected to install the paving stones, shall have at least two years experience in the installation of interlocking concrete paving units.

3. SUBMITTALS.

3.1 Certificates of Conformance. Before delivery of additional paving units, notarized certificates attesting that materials meet the requirements specified shall be submitted in accordance with the SPECIAL CLAUSES.

3.2 Certified Laboratory Test Reports. Certified copies of the reports of all tests specified herein and required in referenced publications shall be submitted to the Contracting Officer.

4. SALVAGE, DELIVERY, STORAGE, AND HANDLING. Salvage, handle, store, and protect paving units in a manner to avoid chipping, breakage, discoloration, or contact with contaminating materials and exposure to the elements.

5. MATERIALS.

5.1 Paving stones (pavers) shall conform to ASTM C 936, 60mm in thickness, made from normal weight aggregates and Portland cement, and shall be of the shape, size, and color as existing.

5.2 Admixtures. Admixtures, if used, shall conform to the requirements of the SECTION: CONCRETE SPILLWAYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAY ENTRANCES.

5.3 Sand. Sand for laying course shall conform to the requirements of ASTM C 33 for washed concrete sand.

6. SAMPLING AND TESTING. All sampling and testing shall be the responsibility of the Contractor.

7. PREPARATION OF SAND LAYING COURSE.

7.1 The sand laying course shall be spread evenly over the area to be paved and then screeded to a level that will produce 1-inch thickness when the paving units have been placed and vibrated.

7.2 The finished sand laying course shall be protected from any damage.

8. PLACING.

8.1 Paving units shall be laid in the pattern, as existing, and the joints between units will not exceed 1/8 inch.

8.2 Gaps at the edge of the paved surface shall be filled with standard edge unit or with units sawcut to fit. Sawcut edges shall be clean, true, and sharp. Whenever possible, units less than 1/3 of original dimension shall not be used.

8.3 Paving units shall be vibrated into the sand laying course using a vibrator capable of 3,000 to 5,000 pounds compaction force with the surface clean and joints open.

8.4 After vibration, clean sand shall be spread over the paving stone surface, allowed to dry, and vibrated into joints with additional vibrator passes and brushing so as to completely fill joints.

8.5 Surplus sand shall be swept from the surface to insure that joints have been completely filled.

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SECTION 02565

MISCELLANEOUS AGGREGATES

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2. DESERT GRAVEL 02565-1

SECTION 02565

MISCELLANEOUS AGGREGATES

1. APPLICABLE PUBLICATIONS. The American Society for Testing and Materials (ASTM) Standards 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.

ASTM C 33	(1990) Concrete Aggregates
ASTM C 131	(1989) Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 144	(1989) Aggregate for Masonry Mortar

2. DESERT GRAVEL. Desert gravel (DG) shall be placed as indicated on the drawings and shall match desert gravel previously placed in Arizona Canal Diversion Channel area from 29th Avenue to 47th Avenue. In the event that the Contractor can not match the existing area, desert gravel shall be placed in accordance with the following requirements:

2.1 Desert Gravel shall be any granitoid igneous rock which has been weathered, in place, and which has as its principal constituents granular fragments of quartz and feldspar. Desert Gravel 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 less than 35 nor more than 60 percent passing the number 4 sieve, not more than 15 percent of the material passing the No. 200 sieve, and shall have a plasticity index of less than 10 for the materials passing the No. 40 sieve.

2.4 Color shall conform to the Munsell Soil Color Chart (1975 edition; published by the Kollmorgen Corp., 2441 North Calvert Street, Baltimore, Maryland 21218). Color shall be light brown, 7.5YR 6/4.

2.5 Material shall be obtained from commercial sources.

2.6 The Contractor shall submit 1 pound sample of DG to the Contracting officer for approval prior to placement.

2.7 DG shall be spread to a depth of 2 inches, raked, dampened, and rolled with a 90 pound roller.

2.8 Preparation of Subgrade. Prior to placing the desert gravel surfacing the subgrade shall be cleaned of all foreign substances. Ruts or soft, yielding spots that may appear in the subgrade; areas having inadequate compaction; and deviations of the surface from requirements set forth herein shall be corrected by loosening, removing, and adding approved material, reshaping to line and grade, and recompacting to specified density requirements. Weed barrier fabric shall be laid on the subgrade under all desert gravel. Weed barrier fabric shall be a permeable polypropylene fabric with a minimum thickness of 2 mil and shall be a product commercially manufactured as a weed barrier fabric.

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SECTION 02600

STONE PROTECTION

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SECTION 02600

STONE PROTECTION

1. APPLICABLE PUBLICATIONS. The American Society for Testing and Materials (ASTM) Standards 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.

ASTM C 88	(1983; R 1990) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 127	(1988) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 295	(1985) Petrographic Examination of Aggregates for Concrete
ASTM C 535	(1989) Resistance to Degradation of large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM D 1141	(1986) Substitute Ocean Water

2. MATERIALS

2.1 Definitions.

a. Cobblestone. Stone which is obtained from alluvial deposits and is nearly spherical and well rounded (river-run), ranging from 4 to 12 inches in size.

b. Stone. Sound, durable, weather-resistant rock over 4 inches in diameter resulting from alluvial deposits.

2.2 Source and Material Approval. No stone shall be placed without prior written acceptance of the stone from the source by the Contracting Officer. The Contractor shall make all arrangements, pay all royalties, and secure all permits for the procurement, furnishing and transporting of stone. The source from which the Contractor proposes to obtain the material shall be selected and a sample submitted a minimum of 45 days in advance of the time when the material will be required in the work. Stone from a proposed source will be tested by the Government for quality compliance. The Government will test one sample at its expense. If the stone sample fails the tests, or if the Contractor desires to utilize more than one source, additional testing will be accomplished by the Government for the sum of \$1700 for each additional sample tested. The costs of such additional tests will be deducted from payment due the Contractor. All test samples (500 pounds minimum) shall be representative of the stone source and shall be obtained by the Contractor under the supervision of the Contracting Officer and delivered at the Contractor's expense to the South Pacific Division Laboratory, U.S. Army Corps of Engineers, 25 Libertyship Way, Sausalito, California 94966. The Contractor shall vary the quarrying, processing, loading and placing operations to secure the type and quality of stone protection specified. If the stone being furnished by the Contractor does not fully meet all the requirements of these specifications, the Contractor shall furnish, at no additional cost to the Government, other stone meeting the requirements of these specifications. Approval of a source shall not be construed as a waiver of the right of the Government to require the Contractor to furnish stone

which complies with these specifications. Materials produced from localized areas, zones or strata will be rejected when such stone does not comply with the specifications.

2.2.1 Potential Stone Sources. Stone may be furnished from any source designated by the Contractor and approved by the Contracting Officer subject to the conditions stated herein.

2.2.2 It is anticipated that stone conforming to these specifications will not be available from the required excavation. The required stone will need to be obtained from an offsite source. If sufficient amounts of stone conforming to these specifications are not available from a source used in the work, the Contractor shall submit stone from another source for approval.

2.3 Quality Compliance. Test results and/or service records will be used by the Contracting Officer to determine the acceptability of the stone protection materials. In the event complete or current compliance test reports and/or service records are not available, the material shall be subjected to the tests outlined in these specifications to determine its acceptability for use in the work. In the event stone is accepted based on service records, samples of the actual stone to be used for construction shall be taken and shall be subjected to the tests outlined in these specifications. Before a proposed source of stone will be considered for sampling and testing the Contractor must demonstrate that the source has sufficient stone to fulfill the contract requirements.

2.3.1 Service records are considered to be acceptable if stone from a proposed source has remained sound and functional after 10 or more years of exposure on a project similar to the one to be constructed under these specifications.

2.4 Quality Compliance Tests for Stone Protection. Stone shall meet the following test requirements:

Test	Test Method	Requirement
Specific Gravity (Bulk SSD)	ASTM C 127	2.50 minimum
Absorption	ASTM C 127	2.0% maximum
Wetting & Drying	SPD Test Procedure(1)	No fracturing(3)
Sulfate Soundness	ASTM C 88(2)	10% max. loss
Abrasion Loss	ASTM C 535	50% max. loss

In addition to the above tests the stone shall be subjected to a petrographic and X-ray diffraction analysis in accordance with ASTM C 295. The stone must not contain any expansive clay.

NOTE: (1): Test procedure for wetting-and-drying test. The initial step of the test is the careful examination of the entire sample and the selection of representative test specimens. The piece should be large enough to produce two cut slabs, one inch thick (+/- 1/4 inch) with a minimum surface area of 30 square inches on one side. Two chunks approximately three by four inches are also chosen. The slabs and chunks are carefully examined under a low-power microscope and all visible surface features are noted and recorded. The specimens are then oven dried at 140 degrees F., for eight hours, cooled and weighed to the nearest tenth of a gram. The test specimens are photographed to show all surface features before the test. The chunks and slabs are then subjected to fifteen cycles of wetting and drying. One slab and one chunk are soaked in fresh tap water, the other slab and chunk are soaked in salt water prepared in accordance with ASTM D 1141. Each cycle consists of soaking for sixteen hours at room temperature and then drying in an oven for eight hours at 140 degrees F. After each cycle the specimens are examined with the low-power microscope to check for opening or movement of fractures, flaking

along edges, swelling of clays, softening of rock surfaces, heaving of micaceous minerals, breakdown of matrix material and any other evidence of weakness developing in the rock. The cycle in which any of these action occurs is recorded. After fifteen cycles, the slabs and chunks are again carefully examined and all changes in the rocks are noted and recorded. The test specimens together with all flakes or particles which come off during the test are oven dried, weighed and photographed.

NOTE: (2): The test shall be made on 50 particles each weighing 100 grams, +/-25 grams, in lieu of the gradation given in C 88.

NOTE: (3): Weakening and loss of individual surface particles is permissible unless bond of the surface grains softens and causes general disintegration of the surface material.

2.4.1 Stone to be used in the work shall be of the same lithology as the stone sampled for testing and for which service records are provided as a basis for approval. All stone shall be sound, durable, hard, and free from lamination, weak cleavages or undesirable weathering. Stone shall be of such character that it will not disintegrate from the action of air, water, or the conditions of handling and placing. All stone shall be clean and free from earth, clay, refuse, and adherent coatings.

2.5 Gradation Sampling and Testing for Stone Protection shall be performed by an approved testing laboratory on samples selected by the Contracting Officer. The Government reserves the right to perform check tests and to use the Contractor's sampling and testing facilities to make the tests. Each gradation sample shall consist of not less than five tons of stone selected at random from the production run for the first test or from material placed on grade or stockpiled on-site for required additional tests. One gradation test shall be required at the beginning of production prior to delivery of stone from the source to the project site and a minimum of one additional test shall be required. All sampling and gradation tests performed by the Contractor shall be under the supervision of the Contracting Officer.

2.6 Gradation.

2.6.1 General. All points on individual grading curves shall be between the boundary limits as defined by smooth curves drawn through specified grading limits plotted on a mechanical analysis diagram. The individual grading curves shall not exhibit abrupt changes in slope denoting skip grading or scalping of certain sizes. Specified grading of all material shall be met both at the source and as delivered to the project. In addition, material not meeting the required grading due to segregation or degradation during placement shall be rejected. If test results show that stone does not meet the required grading, the hauling operation will be stopped immediately and will not resume until processing procedures are adjusted and a gradation test is completed showing gradation requirements are met. All gradation tests shall be at the expense of the Contractor.

2.6.2 Stone may be obtained from any source approved by the Contracting Officer and shall be reasonably well graded between 4 and 12 inches with not less than 25 nor more than 50 percent 6 inches in size.

3. FOUNDATION PREPARATION AND STONE PLACEMENT.

3.1 Prior to placing stone, the subgrade shall have been compacted in accordance with the requirements of SECTION: FILLS AND SUBGRADE PREPARATION, and shall be inspected, in sufficient time prior to each stone placement by the Contractor in order to certify

to the Contracting Officer that it is ready to receive stone. The results of each inspection shall be reported in writing.

3.2 Stone shall be placed beginning at the bottom of the section in a manner that will produce a well-keyed and stable mass of stone. Dumping stone at the top of the slope and rolling the stone into place will not be permitted. Stone shall be placed by direct dumping in place by means of truck, skip box, clam, rock bucket, orange peel, or gradall. The larger stones shall be well distributed and the finished stone protection shall be free of clusters of small or large stone. Driving on stone with equipment will not be permitted. Stone shall be placed in a manner that will produce a surface with the tops of individual stones not more than 2 inches above to 0 inches below the indicated grade. Double decking of flat stones to bring the surface up to the required grade will not be permitted.

4. SCALE WEIGHT MEASUREMENT. Scales used for measurement shall, at the option of the Contractor, be either public scales or approved scales provided by the Contractor. Weighing shall be at the point nearest the work at which a public scale is available or at which it is practicable for the Contractor to provide a scale. Scales shall be standard truck scales of the beam type and shall be equipped with the type registering beam and an "over and under" indicator and be capable of accommodating the entire vehicle. Scales shall be calibrated and resealed as often as necessary and at least once every 3 months, to insure continuous accuracy. All calibrations and sealing of the scales shall be at the expense of the Contractor. Certification shall be submitted to the Contracting Officer.

5. WEIGH BILLS AND DELIVERY TICKETS. Copies of weigh bills or delivery tickets shall be submitted to the Contracting Officer during the progress of the work. The Contractor shall furnish the Contracting Officer or his designated representative scale tickets for each load of material weighed; these tickets shall include tare weight, identification mark of each vehicle weighed, date, time, and location of loading. Tickets shall be furnished at the point and time individual loads arrive at the work site. A master log of all vehicles loading shall be furnished for each day of loading operation. The Contractor shall file with the Contracting Officer or his designated representative, the master log of loadings, certified weigh bills and/or certified tickets within 24 hours of material delivery. Prior to final payment, the Contractor shall furnish written certification that the material recorded on the submitted weigh bills and/or certified tickets are actually used in the construction covered by the contract.

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SECTION 02650

GROUTING STONE PROTECTION

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SECTION 02650

GROUTING STONE PROTECTION

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 Society for Testing and Materials (ASTM).

ASTM C 150 (1989) Portland Cement

ASTM C 309 (1989) Liquid Membrane-Forming
Compounds for Curing Concrete

2. MATERIALS.

2.1 Aggregate shall conform to the requirements specified for fine aggregate of the SECTION: CONCRETE SPILLWAYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAY ENTRANCES.

2.2 Portland Cement shall conform to the requirements of ASTM C 150, Type II. The alkali content of the cement shall not exceed 0.6 percent.

2.3 Water shall be fresh, clean, and potable.

2.4 Color Admixture. The color admixture shall conform to the requirements of the color admixture specified in the SECTION: CONCRETE SPILLWAYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAY ENTRANCES.

2.5 Curing compound shall conform to the requirement of ASTM C 309 Type 1D. The compound shall be free of paraffin or petroleum.

3. MIXING. Grout shall be composed of cement, sand, and water mixed in the proportions as directed. The Contractor shall add color admixture to all grout. Color shall match existing grout exactly and shall conform to Munsell color number 10YR 5/3 with respect to hue, value, and chroma. The estimated cement content requirement per cubic yard of grout shall be 7-1/2 sacks. The water content of the mix shall not exceed 8-1/2 gallons per sack of cement. In calculating total water content of the mix, the amount of moisture carried on the surfaces of aggregate particles shall be included. Slump of grout mix shall be between 9 and 10 inches for the first course and between 7 and 8 inches for the second course or where one course is placed. The grout shall be mixed in a concrete mixer in the manner specified for concrete, except that time of mixing shall be as long as is required to produce a satisfactory mixture, and the grout shall be used in the work within a period of 30 minutes after mixing. Retempering of grout will not be permitted. The consistency of the grout shall be such as to permit gravity flow into the interstices of the stones with the help of spading, rodding, and brooming. Grout batches in the same course shall be uniform in mix, size, and consistency. The color admixture shall be batched in a manner that will assure that the admixture is completely and thoroughly mixed throughout the batch.

4. PLACING.

4.1 Prior to grouting, the stone shall be thoroughly washed with water to wash down the fines and to prevent absorption of water from the grout. The stone shall be kept wet just ahead of the actual placing of grout.

4.2 The grout shall be placed in one course in flat areas and in 2 courses in side slopes. Each course shall be placed full width or in successive lateral strips approximately 10 feet in width, as applicable, extending from toe of slope to top of side slopes. The grout shall be brought to the place of final deposit by approved means and discharged directly on the stone. A splash plate of metal or wood shall be used where necessary to prevent displacement of stone directly under discharge. The flow of grout shall be directed with brooms or other approved baffles to cover the entire area and to assure that all crevices are filled. Sufficient barring shall be done to loosen tight pockets of stone and otherwise aid the penetration of grout. The first course shall fully penetrate the stone blanket. The second course shall be placed as soon as the first course has sufficiently stiffened so that it will not flow when additional grout is added. On side slopes, all brooming shall be uphill.

4.3 Placement and brooming of the grouted surface shall be such that the outer layer of rock projects $\frac{1}{3}$ to $\frac{1}{4}$ their diameter above the grouted surface. After the top course has stiffened the entire surface shall be rebroomed to eliminate runs in the top course and to fill voids caused by sloughing of the layers of grout.

4.4 All surfaces of grouted stone, above the embedment depth specified, shall be cleaned by air-water blasting, sandblasting or a combination thereof.

4.4.1 Air-water Blasting.

4.4.1.1 Equipment used for air-water blasting shall be capable of producing a minimum pressure of 150 psi and shall be of such nature as to adequately perform the work required.

4.4.1.2 The grout will be allowed to set for a minimum of one hour, or other length of time as directed by the Contracting Officer before air-water blasting is commenced. The air-water blasting shall be at right angles to the surface of the grout.

4.4.2 Sandblasting. All grouted stone surfaces to which grout has been applied and cannot be cleaned adequately by air-water blasting shall be sandblasted, in order to remove grout paste remaining on the surface. Sandblasting will not commence at least 14 days after placement of the grout.

4.5 After completion of any strip or panel, to include cleaning, no workers or other load shall be permitted on the grouted surface for a period of 24 hours. The grouted surface shall be protected from injurious action of the sun; shall be protected from rain, flowing water, and mechanical injury; and shall be moist cured or membrane cured at the Contractor's option.

5. CURING AND PROTECTION.

5.1 Moist curing shall consist of covering the grout with a uniform thickness of 2 inches of sand which shall be kept continuously saturated for a period of 14 days.

5.2 Curing compounds shall be applied as soon as the free water disappears and shall be applied in a 2-coat continuous operation by approved power-spraying equipment at a rate of not to exceed 200 square feet per gallon for the combined coats. The second coat shall be applied to overlap the first coat in a direction approximately at right angles to the direction of the first application.

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SECTION 02700
IRRIGATION SYSTEM

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SECTION 02700

IRRIGATION SYSTEM

1. APPLICATION. The irrigation system is to be protected in place. This specification will be used for the repair or replacement of any part of the irrigation system damaged or removed by the Contractor. All necessary drawings will be supplied separately.

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 American National Standards Institute, Inc. (ANSI).

ANSI B16.26 (1983) Cast Copper Alloy Fittings
for Flared Copper Tubes

2.2 American Society for Testing and Materials (ASTM).

ASTM A 120 (1984) Pipe, Steel, Black and
Hot-Dipped Zinc-Coated
(Galvanized) Welded and
Seamless, for Ordinary Uses

ASTM B 88 (1988a) Seamless Copper Water Tube

ASTM D 1785 (1989) Poly(Vinyl Chloride) (PVC)
Plastic Pipe, Schedules 40, 80,
and 120

ASTM D 2241 (1989) Poly(Vinyl Chloride) (PVC)
Pressure-Rated Pipe (SDR Series)

ASTM D 2464 (1989) Threaded Poly(Vinyl Chloride)
(PVC) Plastic Pipe Fittings,
Schedule 80

ASTM D 2466 (1989) Poly(Vinyl Chloride) (PVC)
Plastic Pipe Fittings, Schedule 40

ASTM D 2564 (1988) Solvent Cements for
Poly(Vinyl Chloride) (PVC) Plastic
Pipe and Fittings

2.3 American Water Works Association (AWWA) Standards.

AWWA C 651 (1986) Disinfecting Water Mains

2.4 Federal Specification (FS).

FS WW-V-54 (Rev D; Int. Am-3) Valve, Gate,
Bronze (125, 150 and 200 Pound,
Threaded Ends, Flange Ends,
Solder End and Brazed Ends, for
Land Use)

2.5 Manufacturers Standardization Society of the Valve and Fittings Industry (MSS).

MSS SP-58 (1983) Pipe Hangers and Supports -
Materials, Design and Manufacture

MSS SP-69 (1983) Pipe Hangers and Supports -
Selection and Application

2.6 Maricopa Association Of Governments (MAG).

MAG-01 (1979) Uniform Standard
Specifications for Public Works
Construction

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

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

3.2 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 dripline, 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.

4. EXCAVATION.

4.1 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. Sheet piling and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel.

4.2 Trench Excavation. Trench excavation shall follow, as much as possible, 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 bell holes and 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.

4.3 Jobsite Conditions.

4.3.1 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 persons 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.

4.3.2 Existing and New Plantings. All trenching or other work under the 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.

4.3.3 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.

5. 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 lines have been installed, tested, and approved, backfill material shall be placed in the trench in 6-inch lifts and compacted to 85 percent maximum density. After 12-inches of backfill has been placed, the electrical work shall be installed with 6-inches of backfill placed over it and compacted to 85 percent maximum density. The lateral lines shall be installed and backfill placed in the trench and compacted to 90 percent of maximum density with mechanical tampers or vibrators. 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 with mechanical tampers or vibrators to match lines and grades.

6. MATERIALS. All mainline, (pressure) mainline fittings, and mainline appurtenances (valves, etc.) shall be minimum 200 psi working pressure. Materials shall conform to the respective specifications and other requirements specified below.

6.1 Pipe.

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

6.1.2 Copper Tubing: ASTM B-88, Type K, annealed.

6.1.3 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.

6.1.4 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

6.1.5 Polyethylene pipe (dripline) shall have a maximum length of 250 feet in areas containing ground covers, shrubs, and trees. Driplines 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.

6.2 Joints.

6.2.1 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.

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

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

6.3 Fittings and Specials.

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

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

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

6.4 Gate Valves shall be designed for a working pressure of not less than 200 psig. - 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.

6.4.1 Valves smaller than 3 inches shall be all bronze and shall conform to FS WW-V-54, Type I.

6.4.2 Valves 3 inches and larger shall be iron body, bronze mounted, and shall conform to AWWA C500.

6.5 Backflow Prevention Units.

6.5.1 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 bronze or copper.

6.5.2 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 removable 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.

6.6 Emitters (Drip Line). Emitters shall be independent pressure compensating plastic in-line emitters, (Drip Line) capable of providing a consistent discharge rate of one gallon per hour (gph) 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.

6.7 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:

ASTM Test	Method	Value
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	230degrees F
Specific Gravity	D 792	1.15

6.7.1 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.

6.8 Remote Control Valves and Valve Accessories.

6.8.1 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. The master remote control valve shall be brass; size and type as indicated on the drawings. Other remote control valves shall be as follows:

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

6.8.2 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

6.8.3 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 plans. Tenssiometers are to be connected to hydrovisor bus and field unit as per detail. Surge protection is to be wired as detailed. 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. 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.

6.9 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 (line pressure) shall be 15 psig and the maximum operating pressure shall be 125 psig. The fertilizer injector shall have a chemical to water feed ratio of 1:640 gpm 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.

6.10 Tensiometer shall be solid state maintenance free units, which will react to changes in soil matric potential and will not be affected by salts, fertilizer, chemical changes in the soils nor damage by freezing. The sensing range shall be factory preset and will require no adjustment or calibration. The tensiometer shall be adaptable for direct input to computer processors. The tensiometer shall be available in a minimum of three ranges to allow irrigation above a preset matric potential. The Contractor shall install the tensiometers according to the manufacturer's requirements and as shown on the drawings.

6.11 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 manufacturer's requirements and as shown on the drawings.

6.11.1 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.

6.11.2 Filter Screen shall be 150/mesh stainless steel.

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

6.12 Irrigation Filter (lateral line) shall be a wye type filter with a 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.

6.13 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 reading to 60 psi. The pressure regulator shall be installed according to the manufacturer's requirements and as shown on the drawings.

6.14 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 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 shown on the drawings.

6.15 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.

6.15.1 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.

6.15.2 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.

6.15.3 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.

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

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

6.15.6 Field Satellite Transceiver 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 manufacturers recommendation and as shown on the drawings.

6.16 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 a flow range of 1-30 feet/second. The Contractor shall install the flow sensor according to the manufacturers requirements and as shown on the project drawings.

6.17 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 Contractor shall furnish coupler keys and hose swivels for operating the valves (total of six).

6.18 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 psig
proof pressure 150 psig, minimum

6.19 Gravel shall be pea gravel as indicated on the drawings.

6.20 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, silty sands, and clayey sands. Organic material, trash, debris, silt, sandy silt, clay, sandy clay, broken concrete or pavement and other objectionable material shall not be used.

6.21 Pipe Straps shall conform to the applicable requirements of MSS SP-58 and MSS SP-69.

6.22 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 or Carbon Steel
- 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 manufacturers requirements and as shown on the project drawings.

6.22.1 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 electric 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

6.22.2 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.

6.23 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.

6.24 Pressure sensor (switch) shall be operated by a brass Bourdon tube actuating a mercury switch and enclosed 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.

6.25 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 dripline run shall be capable of delivering a minimum of 17 GPH to the flushing valve.

7. INSTALLATION.

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

7.1.1 Irrigation. Replace irrigation, in kind, in accordance with MAG-01, Section 440 "Irrigation".

7.2 Handling. pipe and accessories shall be handled do 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.

7.3 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.

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

7.4 Placing and Laying. Pipe, dripline, 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 dripline shall rest solidly upon the pipe or dripline bed, with recesses excavated to accommodate joints. Pipe or dripline that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe or dripline 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, dripline, fitting, and valves shall be securely closed (water tight) so that no trench water, earth, or other substance will enter the system. Driplines shall not be placed with kinks or sharp bends; that section of dripline shall be replaced at the direction of the Contracting Officer.

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

7.4.2 Tracer wire or tracer tape shall follow the main 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."

7.5 Jointing.

7.5.1 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.

7.5.2 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.

7.6 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</u> (inches)	<u>Minimum Sleeve Size</u> (inches)
1/2	2
3/4	2-1/2
1, 1-1/4 and 1-1/2	3
2 and 2-1/2	4
3 and 4	6

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

7.7 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, or to be undisturbed trench face if less than 4 feet. Interior of valves shall be cleaned of all foreign matter before installation. When valve boxes are grouped together, provide not less than 12 inches between boxes.

7.8 Reaction Backing.

7.8.1 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.

7.9 Remote Control Valves.

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

7.10 Wire for Remote Control Valves and Tensiometers. For wiring connections from remote control valve assemblies (RCV) and tensiometer assemblies 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 shall 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-Tight, UL Connectors and PT-S5 Sealer or as shown on the drawings.

7.10.1 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, size recommended by the Controller Manufacturer except

that minimum wire size shall be No. 14. Common wire shall be different color from all others and be minimum wire size of No. 12. 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.

7.11 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. 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.

7.12 Connection to Existing Water Lines. The Contractor shall make all necessary arrangements as specified in SECTION: GENERAL REQUIREMENTS. Water meters and taps to the City of Phoenix (COP) water mains shall be provided/installed by the City. Costs shall be paid by the Contractor. The Contractor shall install metal vault as per COP specifications. POC: Mr. Gerald Arakaki, COP (602) 261-8229.

7.13 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. John E. Rodriguez, (602) 262-1501.

8. TESTS.

8.1 After completion of the piping system and prior to backfilling and the installation of the sprinklers and emitters (dripline), 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 psig for a minimum of 3 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.

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

8.1.2 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.

8.2 Coverage Test. When the emitters (dripline) 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.

9. DISINFECTION. The completed line from the backflow prevention unit to the connection to the existing waterline shall be disinfected as prescribed by AWWA C 651.

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

11. 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, and layout for emitters (dripline) for design flow rate and pressure, friction loss through pipe fittings, valves and accessories.

12. 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 (Electric Actuators)

Pressure sensor

Pressure regulator

PVC pipe and fittings

Quick coupling valves and keys Tensiometers

Water meters

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SECTION 02950

TREES, SHRUBS, AND GROUND COVERS

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SECTION 02950

TREES, SHRUBS, AND GROUND COVERS

1. GENERAL. All trees, shrubs and ground cover are to be protected in place except as indicated on the drawings at Repair Area N3. This specification covers the maintenance of existing plants and trees and will be used for the replacement of any trees, shrubs and ground cover removed or damaged by the Contractor.

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 American Joint Committee on Horticultural Nomenclature (AJCHN).

AJCHN-01 (1942; 2nd Ed) Standardized Plant Names

2.2 American National Standards Institute (ANSI).

ANSI Z60.1 (1986) Nursery Stock

2.3 Federal Specification (FS).

FS O-F-241 (Rev D) Fertilizers, Mixed, Commercial

2.4 Maricopa Association of Governments (MAG).

MAG-01 (1979) Uniform Standard Specifications
for Public Works Construction

3. SOURCE INSPECTIONS

3.1 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.

3.2 Topsoil. The source of topsoil will be inspected by the Contracting Officer to determine the acceptability of the topsoil and the depth to which it is to be stripped.

4. SUBMITTALS.

4.1 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.

c. Erosion control material. One six inch square including manufacturer's written installation instructions and descriptive brochure.

4.2 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.

4.3 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. Desert gravel.
- e. Pesticides.
- f. Soil conditioners.
- g. Top soil.

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

4.5 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.

5. DELIVERY, STORAGE, AND HANDLING.

5.1 Delivery.

5.1.1 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.

5.1.2 Plants shall be protected during delivery and transportation 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.

5.1.3 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.

5.1.4 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.

5.1.5 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.

5.2 Storage.

5.2.1 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.

5.2.2 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.

5.3 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.

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

7. MATERIALS.

7.1 Plants.

7.1.1 Plants shall conform to the varieties specified in the original plant list and be true to botanical names as listed in AJCHN-01. Plants shall be in accordance with ANSI Z60.1 except as otherwise stated in the specifications or shown on the original plans. Where the drawings or specifications are in conflict with ANSI Z60.1, the drawings and specifications shall prevail.

7.1.2 Planting stock shall be well-branched and well-formed, sound, vigorous, healthy, and free from disease, sun-scald, windburn, abrasion, and harmful insects or insects 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.

7.1.3 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.

7.1.4 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.

7.1.5 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.

7.1.5.1 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.

7.1.6 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.

7.2 Topsoil.

7.2.1 Topsoil shall be the existing surface soil stripped and stockpiled on the site after the project site has been cleared and grubbed. The soil shall be free from nut grass, refuse, heavy clay, noxious weeds or any material toxic to plant growth.

7.2.2 Additional topsoil, if required, beyond that available from stripping operations, shall be natural, friable soil representative of productive 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 the 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.

7.3 Soil Conditioners and Amendments.

7.3.1 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.

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

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

7.4.1 Tablet form of slow release fertilizers shall be used conforming to FS 0-F241 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.

7.5 Mulch. Mulch shall be 2 inch D.G. free from deleterious materials and shall be stored so as to prevent inclusion of foreign materials.

7.6 Staking Material.

7.6.1 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.

7.6.2 Tie wire shall be 12 gauge annealed galvanized steel.

7.6.3 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.

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

8. SITE PREPARATION.

8.1 Clearing and Grading. Clearing shall consist of the satisfactory removal and disposal of brush, snags, and rubbish occurring within the 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.

8.2 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.

8.3 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.

8.4 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.

8.5 Plant Pits. Plants 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 shown on the drawings.

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

9. INSTALLATION.

9.1 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.

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

9.2.1 Container stock shall be backfilled with topsoil to approximately half the depth of the ball and then 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.

9.3 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.

9.4 Inspections. The trunks of trees shall be inspected for physical damage or insect infestation and required treatment or rejection shall be determined.

9.5 Top Soil, Landscaping, and Planting. The Contractor shall replace top soil, landscaping, and planting, in kind, in accordance with MAG-01, Section 425 "Top Soil" and Section 430 "Landscaping and Planting".

10. PRUNING

10.1 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.

10.2 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.

10.3 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.

11. 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.

11.1 Beginning of 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. Replacement of plants that were not supplied by the Contractor but were relocated under this contract and that die for any reason other than improper handling during transplanting and/or lack of proper care will not be required. Loss through Contractor negligence, however, shall require replacement in kind and size per specification and shall be at the Contractor's expense.

11.2 During the Plant Establishment Period.

11.2.1 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 be responsible for providing necessary water during the plant establishment period. The Contractor shall pay all costs for water associated with the irrigation system.

11.2.2 Plants shall be pruned as required.

11.2.3 Stakes and eroded plant saucers shall be replaced as required.

11.2.4 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.

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

11.3 Termination of the Plant Establishment Period.

11.3.1 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 plant shall be used only if approved by the Contracting Officer.

11.3.2 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 requirements have been satisfactorily accomplished.

b. Plant saucers 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.

12. MAINTAINING EXISTING TREES.

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

12.2 Maintenance operations shall begin immediately after the Contractor has begun work 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.

12.3 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 a sharp instrument, 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 site. Cuts 1/2 inch in diameter and larger shall be painted with the specified tree wound dressing.

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SECTION 03307

CONCRETE SPILLWAYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAY ENTRANCES

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SECTION 03307

CONCRETE SPILLWAYS, SIDEWALKS, CURBS, GUTTERS AND DRIVEWAY ENTRANCES

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 Association of State Highway and Transportation Officials (AASHTO).

AASHTO M 182 (1960; R 1974) Burlap Cloth Made From Jute or Kenaf

1.2 American Society for Testing and Materials (ASTM).

ASTM A 184 (1988) Fabricated Deformed Steel Bar Mats for Concrete Reinforcement

ASTM A 497 (1989) Steel Welded Wire fabric, Deformed, for Concrete Reinforcement

ASTM A 615 (1989) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

ASTM C 33 (CRD-C 133) (1990) Concrete aggregates

ASTM C 94 (CRD-C 31) (1990) Ready-Mixed Concrete

ASTM C 143 (CRD-C 5) (1990) Slump of Hydraulic Cement Concrete

ASTM C 150 (CRD-C 201) (1989) Portland Cement

ASTM C 171 (CRD-C 310) (1969; R 1986) Sheet Materials for Curing Concrete

ASTM C 231 (CRD-C 41) (1989a) Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C 260 (CRD-C 13) (1986) Air-Entraining Admixtures for Concrete

ASTM C 309 (1989) Liquid Membrane-Forming Compounds for Curing Concrete

ASTM C 494 (CRD-C 87) (1986) Chemical Admixtures for Concrete

ASTM C 595 (CRD-C 203) (1989) Blended Hydraulic Cements

ASTM C 618
(CRD-C 255)

(1989a) Fly Ash and Raw or Calcined
Natural pozzolan for Use as a
Mineral Admixture in Portland
Cement Concrete

ASTM C 1077

(1987) Laboratory Testing Concrete
and Concrete Aggregates for use
in Construction and Criteria for
Laboratory Evaluation

ASTM D 1751

(1983) Preformed Expansion Joint
Filler for Concrete Paving and
Structural Construction
(Nonextruding and Resilient
Bituminous Types)

ASTM D 1752

(1984) Preformed Sponge Rubber
and Cork Expansion Joint
Fillers for Concrete Paving and
Structural Construction

ASTM D 1850

(1974; R 1979) Concrete Joint
Sealer, Cold-Application Type

1.3 Federal Specification (FS).

FS SS-S-1401

(Rev C; Notice 1) Sealant, Joint,
NonJet-Fuel-Resistant, Hot
Applied, for Portland Cement
and Asphalt Concrete Pavements

1.4 American Concrete Institute (ACI).

ACI 211.1
(CRD-C 99)

(1989) Standard Practice for
Selecting Proportions for Normal,
Heavyweight, and Mass Concrete

ACI 315R

(1980; Rev 1988) Details and
Detailing of Concrete Reinforcement

ACI 318

(1983; 318R-89) Building Code
Requirements for Reinforced
Concrete.

1.5 U.S. Army Corps of Engineers Handbook for Cement and Concrete (COE)

COE CRD-C 400

(1963) Water for Use in Mixing or
Curing Concrete

COE CRD-C 621

(1989) Non-Shrink Grout

2. SUBMITTALS.

2.1 Test Reports.

2.1.1 Concrete mixture proportions shall be determined by the Contractor and submitted for approval. The proportions of all ingredients and nominal maximum coarse aggregate size that will be used in the manufacture of each quality of concrete shall be stated. Proportions shall indicate weight of cement and water and weights of aggregates in a saturated surface-dry condition. The submission shall be accompanied by test reports from a laboratory complying with ASTM C 1077 which show that proportions thus selected will produce concrete of the qualities indicated. No substitution shall be made in the source or type of materials used in the work without additional tests to show that the new materials and quality of concrete are satisfactory.

2.1.2 Cement and pozzolan will be accepted on the basis of manufacturer's certification of compliance, accompanied by mill test reports that materials meet the requirements of the specification under which it is furnished. Material not meeting specifications shall be promptly removed from the site of work.

2.1.3 Non-shrink Grout.

2.1.3.1 General. Descriptive literature of the grout proposed for use shall be furnished together with a certificate from the manufacturer stating that it is suitable for the application or exposure for which it is being considered. In addition, a detailed plan shall be submitted for approval, showing equipment and procedures proposed for use in mixing and placing the grout.

2.1.3.2 Prepackaged material requiring only the addition of water will be accepted on the basis of certified laboratory test results showing that the material meets the requirements of COE CRD-C 621. When fine aggregate is to be added, the Contractor shall also furnish for approval the design mix proportions together with certified copies of laboratory test results indicating that the mix is in conformance with the requirements of COE CRD-C 621.

2.1.3.3 Mixture proportions using a volume-change controlling ingredient shall be submitted for approval. The submittal shall include the design mix proportions of all ingredients and certified copies of laboratory test results indicating that the materials and the mix is in conformance with the requirements of COE CRD-C 621.

2.2 Manufacturers' Certificate.

2.2.1 Accelerating Admixture shall be certified for compliance with all specification requirements.

2.2.2 Impervious Sheet Curing Materials shall be certified for compliance with all specification requirements.

2.2.3 Air-entraining Admixture shall be certified for compliance with all specification requirements.

2.2.4 Water-reducing Admixture shall be certified for compliance with all specification requirements.

2.2.5 Color Admixture shall be certified to be non-fading by the manufacturer.

3. MATERIALS. Materials shall conform to the respective publications and other requirements specified herein.

3.1 Sources

3.1.1 General. The Contractor will submit in accordance with SPECIAL CLAUSES the sources for all materials used in concrete and grout at least 30 days prior to use. No concrete is to be used without prior approval of the Contracting Officer.

3.1.2 Prequalified Cement Sources. Cement shall be delivered and used directly from a mill of a producer designated as a qualified source. A list of prequalified sources is available from the Commander and director, U.S. Army Engineer Waterways Experimental Station, P.O. Box 631, Vicksburg, MS 39180.

3.2 Concrete Curing Materials.

3.2.1 Burlap. AASHTO M 182 having a weight of 14 ounces or more per square yard when dry, and shall be non-staining.

3.2.2 Impervious Sheeting. ASTM C 171.

3.2.3 Liquid Membrane Curing Compound. ASTM C 309 Type 1D. Compound shall be free of paraffin or petroleum.

3.3 Concrete Protection Materials. Linseed oil mixture shall be equal parts, by volume, of linseed oil and either mineral spirits, naphtha, or turpentine. At the option of the Contractor, commercially prepared linseed oil mixtures formulated specifically for application to concrete to provide protection against the action of deicing chemicals may be used except that emulsified mixtures are not acceptable.

3.4 Joint Materials.

3.4.1 Expansion Joint Fillers. ASTM D 1751 or ASTM D 1752 or shall be resin impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

3.4.2 Joint Sealers. ASTM D 1850 or FS SS-S-1401.

3.5 Reinforcing

3.5.1 Steel bars shall conform to the grade, size, and length shown on the drawings.

3.5.2 Billet-Steel Bars shall conform to ASTM A 615, deformed.

3.5.3 Fabricated Bar Hats. ASTM A 184 clipped or welded mats, billet-steel bars specified herein.

3.5.4 Steel Welded Wire Fabric. ASTM A 497 wire spacing and sizes as indicated on the drawings. For wire with a specified yield strength (fy) exceeding 60,000 psi, fy shall be the stress corresponding to a strain of 0.35 percent.

3.5.5 Wire Ties shall be 16 gage or heavier black annealed wire.

3.6 Concrete Materials

3.6.1 Cementitious Materials shall be Portland cement, Portland-pozzolan cement, or Portland cement in combination with pozzolan and shall conform to appropriate specifications listed below. Usage for architectural concrete shall be restricted to one color and one type.

3.6.1.1 Portland Cement. ASTM C 150, Type II.

3.6.1.2 Portland-Pozzolan Cement. ASTM C 595 Type IP (MS). The Portland cement or clinkers shall meet the requirements of ASTM C 150 for low alkali cement; the pozzolan shall meet the requirements of ASTM C 618 Table 1, available alkali.

3.6.1.3 Pozzolan. Pozzolan shall conform to the requirements of ASTM C 618, Class F with the loss on ignition limited to 6 percent. The optional requirements of Table 2 for available alkalis will be invoked. The optional requirements of Table 4 will be invoked except that the mortar expansion at 14 days limit is amended so that the expansion of the mortar is not more than that of the cement acting alone with the selected aggregates.

3.6.2 Fine and coarse aggregates shall conform to the grading requirements of ASTM C 33.

3.6.3 Nominal Maximum size coarse aggregate shall be 1 inch except 3/4 inch nominal maximum size coarse aggregate shall be used when any of the following conditions exist: the narrowest dimension between sides of forms is less than 7-1/2 inches, the depth of slab is less than 4-1/2 inches or when the minimum clear spacing between reinforcing is less than 2 inches.

3.6.4 Admixtures to be used, when required or permitted shall conform to the appropriate specification listed below:

3.6.4.1 Air-entraining Admixture. ASTM C 260.

3.6.4.2 Accelerating Admixture. ASTM C 494, Type C except no calcium chloride will be allowed.

3.6.4.3 Water-reducing or Retarding Admixtures ASTM C 494, Type A, B or D.

3.6.4.4 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.

3.6.5 Water for mixing and curing shall be fresh, clean, drinkable, and free of injurious amounts of oil, acid, salt, and alkali, except that undrinkable water may be used if it meets the requirements of COE CRD-C 400.

3.6.6 Non-Shrink Grout shall conform to COE CRD-C 621. The type shall be Expansive-Cement.

4. CONCRETE STRENGTH AND USAGE.

4.1 Quality. Mixture proportions are the responsibility of the Contractor. Mixture proportions shall be selected so that the following strength and water-cement ratio requirements are met.

4.1.1 Strength. Specified Compressive Strength f'_c shall be 3000 psi at 28 days.

4.1.2 Water-cement Ratio. Maximum water-cement ratio shall be 0.55 by weight.

4.2 Air Content. Air content as determined by ASTM C 231 shall not exceed 7 percent in all concrete. During the preparation of mix designs the Contractor shall determine the amount of air to be used in the concrete mixtures and this amount will be reported in the mix design submittal. This amount of air will be the sum of the entrapped or naturally entrained air and air entrained by admixtures. Once production of concrete has commenced the amount of air shall not vary more than 1-1/2 percent from the selected air content, nor shall it ever exceed the value stated above.

4.3 Slump. The slump shall be determined in accordance with ASTM C 143 and shall be within the following ranges.

Item	Slump Range
Spillways	1-4 inches
Curb and Gutter	0-3 inches

4.4 Color. An integral color admixture shall be added to all concrete unless directed otherwise by the Contracting Officer. Colors of pigmented concrete shall be considered satisfactory based on the comparative analysis of color produced from test panel(s) in accordance with paragraph: TEST PANEL, and Munsell Color samples in accordance with U. S. Department of Agriculture Handbook 18 - Soil Survey Manual. Color of concrete shall conform to Munsell Color number 10YR5/3 with respect to hue, value and chroma. Evaluation of color shall be made within the time limits prescribed in paragraph: TEST PANEL. The admixture shall be batched in a manner that will ensure that the admixture is completely and thoroughly mixed throughout the concrete. Quantities of admixture added to concrete shall be controlled to avoid variations in color between adjacent placements as well as maintain a consistent coloring throughout the project area.

4.5 Concrete Proportioning. Trial design batches and testing requirements for various qualities of concrete specified shall be the responsibility of the Contractor. Trial mixtures having proportions, consistencies and air content suitable for the work shall be made based on ACI Standard 211.1.

4.6 Average Strength. In meeting the water-cement ratio and strength requirements specified in paragraph: QUALITY above, the selected mixture proportion shall produce an average strength (fcr) exceeding the specified strength f'c by the amount noted in paragraphs Strength, in ASTM C 94.

5. FORMS.

5.1 Sidewalk. Sidewalk forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete, and of a height equal to the full depth of the finished sidewalk. Wood forms shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Wood forms shall have a nominal length of 10 feet, with a minimum of three stakes per form, at maximum spacing of 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Radius bends may be formed with 3/4-inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Form ends shall be interlocked and self-aligning. Forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Forms shall have a nominal length of 10 feet, with a minimum of two welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips, designed for use with steel forms.

5.2 Spillway, Curb, Gutter, and Driveway Entrance. Curb and gutter forms shall be of wood or steel, straight, and of sufficient strength to resist springing during depositing and consolidating the concrete. The outside forms shall have a height equal to the full depth of the curb or gutter. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form. Straight form-4; of wood shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits, or other defects. Wood forms shall have a nominal length of 10 feet, with a minimum of three stakes per form, at maximum spacing of 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Radius bends may be formed with 3/4-inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Form ends shall be interlocked and self-aligning. Forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Forms shall have a nominal length of 10 feet, with a minimum of two welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips, designed for use with steel forms. Rigid forms shall be provided for curb returns, except that benders of thin plank forms may be used for curb or curb returns with a radius of 10 feet or more, where grade changes occur in the return, or where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms for curb returns may be made of 1-1/2 inch benders, for the full height of the curb, cleated together.

6. SUBGRADE PREPARATION. The subgrade shall be constructed to grade and cross section:

6.1 Sidewalk Subgrade. The subgrade shall be thoroughly wetted and then compacted with two passes of a 500-pound roller. Yielding material deflecting more than 1/2 inch under the specified roller shall be removed to a depth of not less than 4 inches below subgrade elevation and replaced with an approved granular material. The material shall then be compacted as described above. The completed subgrade shall be tested for grade and cross section with a template extending the full width of the sidewalk and supported between side forms.

6.2 Spillway, Curb, Gutter, and Driveway Entrance Subgrade. The subgrade shall be of materials equal in bearing quality to the subgrade under the adjacent pavement and shall be placed and compacted to conform with applicable requirements of SECTION: FILLS AND SUBGRADE PREPARATION. The subgrade shall be tested for grade and cross section by means of a template extending the full width of the curb and gutter.

6.3 Maintenance of Subgrade. The subgrade shall be maintained in a smooth, compacted condition, in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected so as to produce a subgrade free from frost when the concrete is deposited.

7. FORM SETTING.

7.1 Sidewalk. Forms for sidewalks shall be set with the upper edge true to line and grade and shall be held rigidly in place by stakes placed at intervals not to exceed 4 feet. After forms are set, grade and alignment shall be checked with a 10-foot straightedge. Forms shall conform to line and grade with an allowable tolerance of 1/8 inch in any 10-foot long section. Forms shall have a transverse slope of 1/4 inch per foot with the low side adjacent to the roadway. Forms shall be coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory. Side forms shall not be removed for less than 12 hours after finishing has been completed.

7.2 Spillway, Curbs and Driveway Entrances. Forms for Spillways, curbs and driveway entrances shall be set to alignment and grade and to conform to the dimensions on the drawings and match existing grades. Forms shall be held rigidly in place by the use of stakes placed at intervals not to exceed 4 feet. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms. The forms on the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms on the back of curb shall remain in place until the face and top of the curb have been finished as specified for concrete finishing. Gutter forms shall not be removed while the concrete is sufficiently plastic to slump in any direction. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

8. REINFORCING PLACEMENT

8.1 General. Reinforcement steel and accessories shall be placed as specified and as shown on contract drawings. Placement details of steel and accessories not specified or shown on the drawings shall be in accordance with ACI 315 and ACI 318 or as directed by the Contracting Officer. Steel shall be fabricated to shapes and dimensions shown, placed where indicated within specified tolerances, and adequately supported during concrete placement. At the time of concrete placement all steel shall be free from loose, flaky rust, scale (except tight mill scale), mud, oil, grease, or any other coating that might reduce the bond with the concrete. No cutting of reinforcing steel by torch will be allowed without approval of the Contracting Officer.

8.2 Welding of steel will be permitted only where indicated on the drawings or as otherwise directed by the Contracting Officer. Welding shall be performed in accordance with AWS D1.4 except where otherwise specified or indicated on the drawings.

8.3 Placing Tolerances.

8.3.1 Spacing. The spacing between adjacent bars and the distance between layers of bars may not vary from the indicated position by more than one bar diameter nor more than one inch.

8.3.2 Concrete Cover. The minimum concrete cover of main reinforcement steel shall be as shown on the drawings. The allowable variation for minimum cover shall be + 1/2 inch.

8.4 Splicing. Splices in steel shall be made only as required. Bars may be spliced at alternate or additional locations at no additional cost to the Government, subject to the approval of the Contracting Officer.

8.4.1 Lapped bars may be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one - fifth the required length of lap or 6 inches.

9. CONCRETE PLACEMENT AND FINISHING.

9.1 General. Concrete placement will not be permitted when, in the opinion of the Contracting officer, weather conditions prevent proper placement and consolidation. Concrete shall be deposited as close as possible to it's final position in the forms, and in so depositing there shall be no vertical drop greater than 5 feet except where suitable equipment is provided to prevent segregation and where specifically authorized.

The amount deposited in each location shall be that which can be readily and thoroughly consolidated. Free water shall be removed prior to placement of concrete. The use of nonagitator equipment for transportation of the concrete will not be permitted.

9.2 Consolidation. Immediately after placing, each layer of spillway and curb concrete shall be consolidated by internal vibrating equipment. Vibrators shall not be used to transport concrete within the forms. Hand spading may be required if necessary with internal vibrating along formed surfaces permanently exposed to view. Form or surface vibrators shall not be used. Consolidation shall proceed independently of all other placing operations. Vibrators of the proper size, frequency and amplitude shall be used for the type of work being performed in conformance with the following requirements:

Head Diameter (inches)	Frequency VPM	Amplitude (inches)
2 - 3-1/2	8000-12000	0.025 - 0.05

The frequency and amplitude shall be within the range indicated in the table above. The vibrator shall be inserted vertically at uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if such exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly. Spare vibrators and a standby power source shall be available at all times during concrete placement.

9.3 Sidewalk and Spillways

9.3.1 Sidewalk Concrete. Concrete shall be placed in the forms in one layer of such thickness that when compacted and finished the sidewalk will be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be tamped and consolidated with a suitable wood or metal tamping bar, and the surface shall be finished to grade with a wood float. Finished surface of the walk shall not vary more than 3/16 inch from the testing edge of a 10 foot straightedge. Irregularities exceeding the above shall be corrected. The surface shall be divided into rectangular areas by means of contraction joints spaced at not more than 5 feet on centers.

9.3.2 Concrete Finishing Sidewalk and Spillways. After straightedging, when most of the water sheen has disappeared, and just before the concrete hardens, the surface shall be finished to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic. Contractor shall submit installation procedures for concrete to the Contracting Officer for approval. All sidewalk and bike path surfaces shall be given a rough texture by brooming with a fiber-bristle broom in a direction transverse to that of the main traffic flow. The rough texture finish shall also be applied to adjacent surfaces a sufficient distance in all directions to provide adequate texture for traction in turning areas.

9.3.3 Edge and Joint Finishing. All slab edges, including those at formed joints, shall be finished carefully with an edger having a radius of 1/8 inch. Transverse joints shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Corner and edges which have crumpled and areas which lack sufficient mortar for proper finishing shall be cleaned and filled solidly with a properly proportioned mortar mixture and then finished.

9.3.4 Contraction Joints. The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least one-fourth of the slab thickness, using a jointer to cut the groove, or by sawing a groove in the hardened concrete with a power-driven saw, unless otherwise approved. Sawed joints shall be constructed by sawing a groove in the concrete with a 1/8-inch blade to the depth indicated. The time of sawing shall be varied, depending on existing and anticipated weather conditions, and such sawing shall be at the required rate. An ample supply of saw blades shall be available on the job before concrete placement is started, and at least one standby sawing unit in good working order shall be available at the jobsite at all times during the sawing operations.

9.3.5 Expansion Joints. Transverse expansion joints shall be installed at sidewalk returns and opposite expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints shall be installed as indicated. Transverse expansion joints shall be filled with 1/2-inch joint filler strips. Joint filler shall be placed with top edge 1/4 inch below the surface and shall be held in place with steel pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/8 inch, and concrete over the joint filler shall be removed. Expansion joints shall be formed about structures and features that project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated. The filler shall be installed in such manner as to form a complete, uniform separation between the structure and sidewalk pavement. At the end of the curing period, expansion joints shall be cleaned and filled with joint sealer. Concrete at the joint shall be surface dry, and the atmospheric and pavement temperatures shall be above 50 degrees F. at the time of application of joint-sealing materials. Joints shall be filled flush with the concrete surface in such manner as to minimize spilling on the walk, surface. Spilled sealing material shall be removed immediately and the surface of the walk cleaned. Dummy groove joints shall not be sealed.

9.3.6 Surface Uniformity. The completed surface shall be uniform in color, and free of surface blemishes and tool marks.

9.4 Curb, Gutter, and Driveway Entrance Concrete. Concrete shall be placed in layers not to exceed 6 inches. Concrete shall be thoroughly consolidated by tamping and spading or with approved mechanical vibrators.

9.4.1 Concrete Finishing. The edges of the gutter and top of the curb shall be rounded with an edging tool to a radius of 1/2-inch and the surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with a fine-hair brush with longitudinal strokes. Immediately after removing the front curb form, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The surface, while still wet, shall be brushed in the same manner as the gutter and curb top. The top surface of gutter and entrance shall be finished to grade with a wood float. Except at grade changes or curves, finished surfaces shall not vary, from the testing edge of 10-foot straightedge, more than 1/8 inch for gutter and entrance and 1/4 inch for top and face of curb. Irregularities exceeding the above shall be satisfactorily corrected. Visible surfaces and edges of finished curb and gutter shall be free of blemishes and form and tool marks, and shall be uniform in color, shape, and appearance.

9.4.2 Joints. Expansion joints and contraction joints shall be constructed at right angles to the line of curb and gutter.

9.4.2.1 Contraction Joints. Contraction joints shall be constructed by means of 1/8-inch thick separators, of a section conforming to the cross section of the curb and gutter. Contraction joints shall be constructed directly opposite contraction joints in abutting portland-cement-concrete pavement. Where curb and gutter do not abut portland-cement-concrete pavements, contraction joints shall be so placed that monolithic sections between curb returns will not be less than 5 feet nor greater than 15 feet in length. Separators shall be removed as soon as practicable after concrete has set sufficiently to preserve the width and shape of the joint. Separators shall be removed prior to finishing.

9.4.2.2 Expansion joints shall be formed by means of preformed expansion-joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints shall be provided in curb at the end of all returns. Expansion joints shall be provided in curb and gutter directly opposite expansion joints of abutting portland-cement-concrete pavement and shall be of the same type and thickness as joints in the pavement. Where curb and gutter do not abut portland-cement-concrete pavement, expansion joints at least 1/2-inch in width shall be provided at intervals not exceeding 25 feet. Expansion joints shall be provided in non-reinforced concrete gutter at locations indicated.

10. CURING AND PROTECTION.

10.1 Curing and Protection. All concrete shall be cured by an approved method for a period of 7 days. Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, and mechanical injury. All materials and equipment needed for adequate curing and protection shall be available and at the placement site prior to start of concrete placement. Concrete shall be protected from the damaging effects of rain for 12 hours, flowing water for 14 days. Immediately after the finishing operations, exposed concrete surfaces shall be cured by one of the following methods as the Contractor may elect.

10.1.1 Mat Method. The entire exposed surface shall be covered with two or more layers of burlap. Mats shall overlap each other at least 6 inches. The mat shall be thoroughly wetted with water prior to placing on concrete surface and shall be kept continuously in a saturated condition and in intimate contact with concrete for not less than 7 days.

10.1.2 Impervious Sheeting Method. The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used. The curing medium shall not be less than 18 inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or by placing a bank of moist earth along edges and laps in the sheets. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

10.1.3 Membrane-Curing Method. The entire exposed surface shall be covered with a membrane-forming curing compound. Curing compound shall be applied in two coats by hand-operated pressure sprayers at a coverage of approximately 200 square feet per gallon for both coats. The second coat shall be applied in a direction approximately at right angles to the direction of application of the first coat. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. Apply an additional coat to all surfaces showing discontinuity, pinholes or other defects. Concrete surfaces that are subjected to heavy rainfall within 3 hours after curing compound has been applied shall be resprayed by the above method and at the above coverage at no additional cost to the Government. Expansion joint openings shall be sealed at the top by inserting moistened paper or fiber

rope or covering with strips of waterproof paper prior to application of the curing compound, in a manner to prevent the curing compound entering the joint. Concrete surfaces to which membrane-curing compounds have been applied shall be adequately protected for 7 days from pedestrian and vehicular traffic and from any other action that might disrupt the continuity of the membrane. Any area covered with curing compound and damaged by subsequent construction operations within the 7-day curing period shall be resprayed as specified above at no additional expense to the Government.

10.2 Backfilling. After curing, debris shall be removed, and the area adjoining the concrete shall be backfilled, graded, and compacted to conform to the surrounding area in accordance with lines and grades indicated.

10.3 Protection. Completed concrete shall be protected from damage until accepted. The Contractor shall clean concrete discolored during construction. Concrete that is damaged shall be removed and reconstructed for the entire length between regularly scheduled joints. Refinishing the damaged portion will not be acceptable. Removed damaged portions shall be disposed of as directed.

11. SEALING JOINTS. The approximately horizontal sections of expansion joints and the top one-inch depth of contraction-joint openings of gutter shall be sealed with joint sealer. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing shall be done so that the material will not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above 50 degrees F. at the time of application of joint-sealing materials. Excess material on exposed surfaces of the concrete shall be removed immediately and exposed concrete surfaces cleaned.

12. CONTRACTORS QUALITY CONTROL

12.1 Field-Control Tests. Preparation of field-control samples and testing of samples shall be by the Contractor at no additional cost to the Government. The taking of samples, the making of test specimens, and the testing thereof shall be performed in accordance with ASTM C 94 and under the supervision of the Contracting Officer.

12.2 Curing Compound. No curing compound shall be applied until it has been verified that the compound is properly mixed and ready for spraying. At the end of each operation the quantity of compound used and the area of concrete surface covered shall be reported and the rate of coverage in square feet per gallon shall be computed. The report shall state whether coverage is uniform. When the coverage rate of curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

12.3 Test Panel. The Contractor shall place a test panel for each colored concrete specified with a minimum dimension of 6 feet by 6 feet by 6 inches thick. The test panel shall be placed in the presence of the Contracting Officer, and the mix design shall conform in all respects to the mix proposed for use in the project. The concrete shall be finished, protected, and cured adjacent to the site of proposed construction using methods proposed for use by the Contractor on the features of the project which shall receive colored concrete. Only one half of the panel area will be cured with curing compound. The remaining portion will not be cured. The test panel shall not be protected from the effects of the sun while curing. Color comparisons as a basis for acceptance of color shall not be made in less than 14 days after placement of concrete for the test panel. Wetting of the concrete shall not be permitted within a period of 7 days prior to making color comparisons. No concrete shall be scheduled for placement within 20 days of construction of the test panel, and no concrete shall be placed prior to demonstrated compliance with the color requirements of these specifications. When,

in the opinion of the Contracting Officer, the test panels do not conform to color requirements herein, the Contractor shall continue to place additional test panels at no additional cost to the Government until a final mix design has been developed that produces concrete conforming to color requirements herein. Approval of test panel color and mix design shall not relieve the Contractor from the requirements of these specifications. The Contractor shall not remove the test panel until concrete work is complete. At completion of concrete work, the test panel shall be considered to be scrap materials and disposed of in accordance with SECTION: GENERAL REQUIREMENTS. In addition, test panels will be constructed to document the quality of the color of the tinted curing compound. The test panel will be constructed of any of the proposed colored concrete mixes to be supplied by the Contractor. After a period of 3 days, the color of the exposed concrete surfaces will be evaluated to assure that the color of the curing compound as applied to the concrete conforms to the requirements of the paragraph: COLOR.

12.4 Placing. The placing foreman shall not permit placing to begin until he has verified that an adequate number of acceptable vibrators in working order and with competent operators are available. Placing shall not be continued if any pile is inadequately consolidated. If any batch of concrete fails to meet the temperature requirements, immediate steps shall be taken to improve temperature controls.

12.5 Reports. All results of tests conducted at the project site shall be reported. These requirements do not relieve the Contractor of the obligation to report certain failures immediately. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all Contractor quality control records.

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