AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF PAGES
W01B0001	1	2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0002	07 DEC 2000		

6. ISSUED BY CODE

7. ADMINISTERED BY *(If other than Item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

CODE FACILITY CODE

(√)	
X	9A. AMENDMENT OF SOLICITATION NO. DACW09-01-B-0001
	9B. DATED *(SEE ITEM 11)* 21 DEC 2000 (BID OPENING)
	10A. MODIFICATION OF CONTRACTS/ORDER NO.
	10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

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

(a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(√)	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

RED ROCK DETENTION BASIN SCOUR PROTECTION AND CHANNEL OUTLET, CLARK COUNTY, NEVADA.

REPLACE Sections 00010, 00100, and 00800 with Enclosure 'A'.

Enclosure 'A':
Section 00010 Solicitation Contract Form
Section 00100 Instructions to Bidders
Section 00800 Special Contract Requirements

---- Continued On Next Page ----

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY *(Signature of Contracting Officer)*	16C. DATE SIGNED

Red Rock Detention Basin Scour Protection and Channel Outlet, Clark County, Nevada.
(SF 30, continued)

Red Rock Outlet Channel

REPLACE Sections 01200, 01251, 02200, and 02250 with Enclosure No. 1
ADD Sections 02900, 02910, 02921, and 02950 with Enclosure No. 2
REPLACE Drawings 196/562, 196/564, and 196/571 with Enclosure No. 3
ADD Drawings 196/590, 196/591, and 196/592 with Enclosure No. 4

Scour Protection

REPLACE Sections 01250, 02200, 02250, 02600, 02832, 03360, and 05500 with Enclosure No. 5

REPLACE Drawings 196/602, 196/612, and 196/619 with Enclosure No. 6

6 Enclosures:

1. (a) 01200 General Requirements
   (b) 01251 Measurement and Payment (Outlet Channel)
   (c) 02200 Excavation
   (d) 02250 Fills and Subgrade Preparation
2. (a) 02900 Landscape Contractor Prequalification
   (b) 02910 Native Plant Extraction and Salvage
   (c) 02921 Seeding
   (d) 02950 Simulated Desert Varnish Rock Color Mitigation
3. (a) 196/562 (District File No.) Index to Contract Drawings, Abbreviations, Symbols, and Survey Control
   (b) 196/564 Fencing Plan and Permanent Right-of-Way
   (c) 196/571 Waste Pile Grading Plan
4. (a) 196/590 Landscape Plan
   (b) 196/591 Landscape Plan
   (d) 196/592 Landscape Plan
5. (a) 01250 Measurement and Payment (Scour Protection)
   (b) 02200 Excavation
   (c) 02250 Fills and Subgrade Preparation
   (d) 02600 Stone Protection
   (e) 02832 Temporary Tortoise Fencing
   (f) 03360 Roller-Compacted Concrete (RCC)
   (g) 05500 Miscellaneous Metal
6. (a) 196/602 Index to Contract Drawings, Abbreviations, and Symbols
   (b) 196/612 Miscellaneous Details
   (c) 196/619 General Disposal Location Plan

TABLE OF CONTENTS

CHANNEL OUTLET AND SCOUR PROTECTION

BIDDING REQUIREMENTS, CONTRACTS FORMS AND CONTRACT CONDITIONS

SOLICITATION, OFFER, AND AWARD *(Construction, Alteration, or Repair)*	1. SOLICITATION NO. DACW09-01-B-0001	2. TYPE OF SOLICITATION [X] SEALED BID (IFB) [ ] NEGOTIATED *(RFP)*	3. DATE ISSUED 09-Nov-2000	PAGE OF PAGES 1 OF 119

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

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO. W81EYN-9148-9612	6. PROJECT NO.

7. ISSUED BY CODE DACW09	8. ADDRESS OFFER TO *(If Other Than Item 7)* CODE
CONTRACTING DIVISION PO BOX 532711 LOS ANGELES, CA 90053-2325	**See Item 7**

9. FOR INFORMATION CALL:	A. NAME Julie Ayala	B. TELEPHONE NO. *(Include area code) (NO COLLECT CALLS)* (213) 452-3241

SOLICITATION

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

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

RED ROCK DETENTION BASIN - SCOUR PROTECTION & OUTLET CHANNEL
CLARK COUNTY, NEVADA

THE ESTIMATED COST RANGE OF THIS ACQUISITION IS $1,000,000.00 - $5,000,000.00

BIDDERS PLEASE NOTE: THIS PROJECT MAY BE DELAYED, CANCELLED OR REVISED AT ANY TIME DURING THE SOLICITATION, NEGOTIATION AND/OR FINAL AWARD PROCESS

THIS A 100% SMALL BUSINESS SET-ASIDE PROCUREMENT

11. The Contractor shall begin performance within 1 calendar days and complete it within 270 calendar days after receiving
[X] award, [ ] notice to proceed. This performance period is [X] mandatory, [ ] negotiable. *(See* SECTION 00800 *.)*

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

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 01:00:00 *(hour)* local time 12/21/2000 *(date).* If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee [X] is, [ ] is not required.

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

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

SOLICITATION, OFFER, AND AWARD (Continued)

(Construction, Alteration, or Repair)

OFFER ***(Must be fully completed by offeror)***

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)* **See 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 requirements stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS	SEE SCHEDULE OF PRICES

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:

SEE SCHEDULE

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 CODE

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 or incorporated by reference in or attached to this contract.

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

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

SECTION 00010 Solicitation Contract Form

Pricing Schedule

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	OUTLET CHANNEL				
1.	TRAFFIC CONTROL	1	Job	LS	_____
2.	DIVERSION AND CONTROL OF WATER	1	Job	LS	_____
3.	CLEAR SITE & REMOVE OBSTRUCTIONS	1	Job	LS	_____
4.	EXCAVATION	9,090	m^3	_____	_____
5.	DEMOLITION - EXISTING RIPRAP	1	Job	LS	_____
6.	DEMOLITION - EXISTING 2.438m CAST-IN-PLACE CONCRETE PIPE	1	Job	LS	_____
7.	MISCELLANEOUS FILL	10,500	m^3	_____	_____
8.	COMPACTED FILL	1,670	m^3	_____	_____
9.	COMPACTED FILL, PIPE	920	m^3	_____	_____
10.	COMPACTED FILL, ROAD	660	m^3	_____	_____
11.	REINFORCED CONCRETE PIPE – 2.438 m DIA.	85.5	m	_____	_____
12.	REINFORCED CONCRETE PIPE - 1.829 M DIA.	37.7	m	_____	_____
13.	REINFORCED CONCRETE PIPE - 1.524 M DIA.	40	m	_____	_____
14.	REINFORCED CONCRETE PIPE - 0.457 M DIA.	25	m	_____	_____
15.	AGGREGATE BASE COURSE	1,600	T	_____	_____

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
***16.**	**TEMPORARY CONSTRUCTION FENCING**	**1,496**	**m**	_____	_____
17.	CHAIN LINK FENCING	952	m	_____	_____
18.	DOUBLE SWING GATES	2	Ea	_____	_____
19.	PIPE SAFETY RAILING	24	m	_____	_____
20.	TRASH RACK AT 1.829 PIPE HEADWALL	1	Job	LS	_____
21.	TRASH RACK AT 1.524 PIPE HEADWALL	1	Job	LS	_____
22.	FILTER MATERIAL FOR RIPRAP	700	T	_____	_____
23.	RIPRAP PLACEMENT	2,175	T	_____	_____
24.	MANHOLE JUNCTION STRUCTURE	1	Job	LS	_____
25.	PRECAST TEE AND CATCH BASIN	1	Job	LS	_____
26.	PRECAST TEE	1	Job	LS	_____
27.	1.829 PIPE HEADWALL AND APRON	1	Job	LS	_____
28.	1.524 PIPE HEADWALL AND APRON	1	Job	LS	_____
29.	STILLING BASIN	1	Job	LS	_____
***30.**	**SOIL STABILIZER**	**3**	**ha**	_____	_____
***31.**	**LANDSCAPING**	**1**	**Job**	**LS**	_____
32.	WASTE PILE DISPOSAL	50,000	m^3	_____	_____
	SUBTOTAL LINE ITEMS 1-32:				**$**_____

ABBREVIATIONS:

m = meter — m^3 = cubic meter
T = metric ton — Ea = each
LS = lump sum — **ha = hectare (10,000 m2)**

* DENOTES CHANGES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	SCOUR PROTECTION				
33.	DIVERSION AND CONTROL OF WATER	1	Job	LS	_____
34.	CLEAR SITE&REMOVE OBSTRUCTION	1	Job	LS	_____
35.	EXCAVATION	56,550	Yd^3	_____	_____
36.	COMPACTED FILL	22,302	Yd^3	_____	_____
37.	FILTER MATERIAL	2,940	Yd^3	_____	_____
***38.**	**18" RIPRAP PROTECTION**	**5,500**	**T**	_____	_____
39.	12" RIPRAP PROTECTION	4,570	T	_____	_____
40.	6" RIPRAP PROTECTION	2,980	T	_____	_____
41.	ROLLER-COMPACTED CONCRETE (RCC)	10,229	Yd^3	_____	_____
42.	PORTLAND CEMENT FOR RCC	1,866	T	_____	_____
43.	POZZOLAN FOR RCC	377	T	_____	_____
44.	AGGREGATE BASE COURSE	135	T	_____	_____
45.	ACCESS GATES	1	Ea	_____	_____
46.	TEMPORARY TORTOISE FENCING	2,000	Ft	_____	_____
47.	PIPE SAFETY RAILING	499	Ft	_____	_____
48.	PIPE BOLLARD	1	Ea	_____	_____
***49.**	**SOIL STABILIZATION**	**25**	**AC**	_____	_____
***50.**	**DISPOSAL SITE MISC FILL FOR BERMS**	**70,000**	**Yd^3**	_____	_____

* DENOTES CHANGES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
*51.	DISPOSAL SITE FACING MATERIAL FOR BERMS	6,000	Yd^3	_____	_____

SUBTOTAL LINE ITEM NOS. 33-51: $_____

TOTAL ESTIMATED AMOUNT, LINE ITEMS 1-51: $_____

ABBREVIATIONS:

Ft = foot	Yd^3 = cubic yard
T = ton (2,000 lb)	Ea = each
LS = lump sum	AC = acre

* DENOTES CHANGES

SECTION 00100 Instructions to Bidders

CLAUSES INCORPORATED BY FULL TEXT

52.0000-4010 INQUIRIES

Perspective bidders/offerors should submit inquiries related to this solicitation by writing or calling the following (collect calls will not be accepted:

(1) For inquiries of a contractual nature (solicitation requirements, interpretation of contractual language) call:
Julie Ayala at 213/452-3241
Facsimile No. 213/452-4187

For bid results only, call (213) 452-3235.

(2) All technical questions on the specification or drawings will be submitted in writing to:
Address:
USAED-Los Angeles, P.O. Box 532711, Los Angeles, CA 90053-2325

(3) Please include the solicitation number, project title and location of project with your questions. Written inquiries must be received by this office not later than 14 calendar days prior to bid opening date/date set for receipt of offers.

(4) Oral explanations or instructions are not binding. Any information given to a bidder/offeror which impacts the bid/offer will be given in the form of a written amendment to the solicitation.

52.0000-4023 SAFETY REQUIREMENTS

The bidder's attention is directed to the latest version of U.S Army Corps of Engineers Safety and Health Manual, EM 385-1-1, which will be strictly enforced. This publication may be obtained from the US Army Engineer District, Los Angeles, ATTN: Safety Office, P.O. Box 532711, Los Angeles, California 90053-2325.

52.0001-4004 BID RESULTS

The telephone number for bid results after the opening is Area Code (213) 452-3235.

52.0214-4001 DIRECTIONS FOR SUBMITTING BIDS

(a) Envelopes containing bids, bid guarantees, etc., must be sealed, marked and addressed as follows:

TO: US ARMY ENGINEER DISTRICT, LOS ANGELES
ATTN: CESPL-CT-P
P.O. Box 532711

Los Angeles, California 90053-2325

Bid under IFB No. DACW09-01-B-0001
Bid Opening Date: December 21, 2000 at 1:00 P.M.

(b) Hand carried bids shall be deposited at US Army Engineer District, Los Angeles, 911 Wilshire Blvd, Los Angeles, California 90017, prior to the time and date set for opening of bids. Hand carried bids submitted prior to 12:45 P.M. on the bid opening date will be accepted in Suite 1035 and 1040 by available personnel. FOR THE TIME PERIOD OF 12:45 P.M. TO 1:00 P.M., BIDS MUST BE SUBMITTED TO SUITE 1035 (BID OPENING ROOM), TO THE BID OPENING OFFICER ONLY. BIDS WILL NOT BE ACCPETED BY ANY OTHER PERSONNEL OR ANY OTHER LOCATION. The official bid opening time will be the clock posted on the wall in the bid opening room.

(c) Telegraphic Modifications to Bids should be addressed to:

US Army Engineer District, Los Angeles
Procurement Branch, Suite 1040
911 Wilshire Blvd
Los Angeles, California 90017

ARITHMETIC DISCREPANCIES EFARS 52.214-5000

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

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

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

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

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

(End of statement)

TELEGRAPHIC BIDS/OFFERS ARE NOT ACCEPTABLE

Any telegram to modify or withdraw a bid/offer sent to this office must be physically delivered to the office designated for receipt of bid/offer by the date and time set for bid opening/receipt of proposals.
No one from this office will be dispatched to the local telegraph office to pick up any telegram for any reason.

52.0214-4599 EVALUATION FOR AWARD

The Government contemplates award of one contract to the responsive, responsible bidder who submits the low bid for the total of all the items in the Bidding Schedule.

52.228-4507 BID GUARANTEE FORM AND AMOUNT

When bids/proposals exceed $100,000, the offeror shall furnish a separated bid guarantee in accordance with the solicitation provision titled "Bid Guarantee", FAR 52.228-1. In accordance with FAR 28.101-2 the bid guarantee amount shall be a least 20 percent of the "bid price" but shall not exceed $3 million. When the penal sum is expressed as a percentage, a maximum dollar limitation may be stated. If there are option line items on the Pricing Schedule (Schedule B), the term "bid price" is hereby defined as the total bid not to include any amount for line items designated as "options". In bids/proposals that contain "additives", the "bid price" is defined as the total of all bid items including additive line items. FAR 28.106-1 states that a Standard Form (SF) 24 shall be used for the bid bond. In accordance with FAR 28.202(a)(1), corporate sureties utilized must appear on the list contained in the Department of Treasury Circular 570 titled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and Acceptable Reinsuring Companies."

52.211-2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999)

Copies of specifications, standards, and data item descriptions cited in this solicitation may be obtained--

(a) From the ASSIST database via the Internet at http://assist.daps.mil; or

(b) By submitting a request to the--Department of Defense Single Stock Point (DoDSSP), Building 4, Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Telephone (215) 697-2667/2179, Facsimile (215) 697-1462.

(End of provision)

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

"Government" means United States Government.

"Offer" means "bid" in sealed bidding.

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

(End of provision)

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

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

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

(End of provision)

52.214-4 FALSE STATEMENTS IN BIDS (APR 1984)

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

(End of provision)

52.214-5 SUBMISSION OF BIDS (MAR 1997)

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

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

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

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

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

52.214-6 EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984)

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

(End of provision)

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

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

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

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

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

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

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

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

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

(End of provision)

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

(a) Bids must be (1) submitted on the forms furnished by the Government or on

copies of those forms, and (2) manually signed. The person signing a bid must initial each erasure or change appearing on any bid form.

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

(1) Lump sum bidding;

(2) Alternate prices;

(3) Units of construction; or

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

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

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

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

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

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

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

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

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

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

(End of provision)

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

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

(End of provision)

52.216-1 TYPE OF CONTRACT (APR 1984)

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

(End of clause)

52.228-1 BID GUARANTEE (SEP 1996)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.-

(c) The amount of the bid guarantee shall be (20%) percent of the bid price or $$3,000,000.00, whichever is less.-

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.-

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Patricia Brown Trainer, C/O Julie Ayala, P.O. Box 532711, Los Angeles, CA 90053-2325

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

(End of provision)

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

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

(b) Site visits may be arranged during normal duty hours by contacting:
Name: Rob Caskie
Address:
Telephone: 702/252-4160
A site visit will be conducted on 21 Nov 2000 at 10:00AM, at Charleston Blvd. (Highway 159 at Red Rock Detention Basin, about 2.5 miles west of Town Center Drive, Las Vegas, NV.

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions 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. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://www.arnet.gov.far
http://farsite.hill.af.mil
http://www.dtic.mil.dfars

SECTION 00800 Special Contract Requirements

CLAUSES INCORPORATED BY FULL TEXT

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

The Contractor shall be required to (a) commence work under this contract within 1calendar 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 270 calendar days after the Contractor receives the Notice to Proceed. The Notice of Award constitutes the Notice to Proceed. The Notice to Proceed will be provided at the time of notice of award. The time stated for completion shall include final cleanup of the premises.

*The Contracting Officer shall specify either a number of days after the date the contractor receives the notice to proceed, or a calendar date.

(End of clause)

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

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of $470.00 for each calendar day of delay until the work is completed or accepted.

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

(End of clause)

52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.

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

(a) The offeror's attention is called to the Equal Opportunity clause and the

Affirmative Action Compliance Requirements for Construction clause of this solicitation.

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

Goals for minority participation for each trade	Goals for female participation for each trade
13.9%	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.

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

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

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

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

(3) Estimated dollar amount of the subcontract;

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

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

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

52.228-12 Prospective Subcontractor Requests for Bonds. (OCT 1995)

In accordance with Section 806(a)(3) of Pub. L. 102-190, as amended by Sections 2091 and 8105 of Pub. L. 103-355, upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to the Miller Act, the Contractor shall promptly provide a copy of such payment bond to the requester.

52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) “Irrevocable letter of credit” (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an initial expiration date that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal at least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institutions rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of less than $25 million in the past year, ILCs over $5 million must be confirmed by another acceptable financial institution that had letter of credit business of less than $25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

_____

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date _____

IRREVOCABLE LETTER OF CREDIT NO. _____

Account party's name _____

Account party's address _____

For Solicitation No. _____(for reference only)

TO: [U.S. Government agency]

[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States $_____. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on _____, or any automatically extended expiration date.

2. We hereby undertake to honor your or the transferee's sight draft(s) drawn on the issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60

days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

_____

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

_____
[Confirming Financial Institution's Letterhead or Name and Address]

(Date) _____

Our Letter of Credit Advice Number _____

Beneficiary: _____ [U.S. Government agency]

Issuing Financial Institution: _____

Issuing Financial Institution's LC No.: _____

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by _____ [name of issuing financial institution] for drawings of up to United States dollars _____/U.S. $_____ and expiring with our close of business on _____ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at _____.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

_____

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:

SIGHT DRAFT

_____

[City, State]

(Date) _____

[Name and address of financial institution]

Pay to the order of _____ [Beneficiary Agency] _____ the sum of United States $_____. This draft is drawn under Irrevocable Letter of Credit No. _____.

_____

[Beneficiary Agency]

By: _____

(End of clause)

52.228-15 Performance and Payment Bonds--Construction (JUL 2000)-

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

Original contract price means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) Amount of required bonds. Unless the resulting contract price is $100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) Performance bonds (Standard Form 25). The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) Payment Bonds (Standard Form 25-A). The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) Additional bond protection. (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) Furnishing executed bonds. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) Surety or other security for bonds. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the U.S. Department of Treasury, Financial Management Service, Surety Bond Branch, 401 14th Street, NW, 2nd Floor, West Wing, Washington, DC 20227.

(e) Notice of subcontractor waiver of protection (40 U.S.C. 270b(c). Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such

person has first furnished labor or material for use in the performance of the contract.

(End of clause)

52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER—CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(a) Method of payment. (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term “EFT” refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either--

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) Contractor's EFT information. The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) Mechanisms for EFT payment. The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) Suspension of payment. If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) Contractor EFT arrangements. If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) Liability for uncompleted or erroneous transfers. (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for--

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and--

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) EFT and prompt payment. A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) EFT and assignment of claims. If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register in the CCR database and shall be paid by EFT in accordance with the terms of this clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(i) Liability for change of EFT information by financial agent. The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(j) Payment information. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.

(End of Clause)

52.236-4 PHYSICAL DATA (APR 1984)

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.

(a) The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys.

(b) Weather conditions. The contractor shall satisfy himself as to the hazards likely to arise from weather conditions.

(c) Transportation facilities. The contractor shall make his own investigation of the conditions of existing public and private roads and clearances, restrictions, bridge load limits and other limitations affecting transportation and ingress and egress at the job site. The unavailability of transportation facilities or limitations thereof shall not become a basis for claims against the Government or extensions of time for completion of the work.

(d) N/A . . . . . [insert other pertinent information].

52.236-16 QUANTITY SURVEYS ALTERNATE I (APR 1984)

(a) 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.

(b) The Contractor shall conduct the original and final surveys and surveys for any periods for which progress payments are requested. All these surveys shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance. The Government shall make such computations as are necessary to determine the quantities of work performed or finally in place. The Contractor shall make the computations based on the surveys for any periods for which progress payments are requested.

(c) 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.

52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment

by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by," or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed".

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements, and (2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

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

252.236-7001 CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS (AUG 2000)

(a) The Government will not provide the Contractor, any plans or specifications. Plans and specifications are provided on CD-ROM.
(b)
(b) The Contractor shall--

(1) Check all drawings furnished immediately upon receipt;

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

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

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

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

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

Title File Drawing No. See Drawing List

(End of clause)

252.247-7023 Transportation of Supplies by Sea (MAR 2000)

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

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DoD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel,

boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b)(1) The Contractor shall use U.S.-flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessels if--

(i) This contract is a construction contract; or

(ii) The supplies being transported are--

(A) Noncommercial items; or

(B) Commercial items that--

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it contracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that --

(1) U.S.-flag vessels are not available for timely shipment;

(2) The freight charges are inordinately excessive or unreasonable; or

(3) Freight charges are higher than charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum --

(1) Type, weight, and cube of cargo;

(2) Required shipping date;

(3) Special handling and discharge requirements;

(4) Loading and discharge points;

(5) Name of shipper and consignee;

(6) Prime contract number; and

(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information --

(1) Prime contract number;

(2) Name of vessel;

(3) Vessel flag of registry;

(4) Date of loading;

(5) Port of loading;

(6) Port of final discharge;

(7) Description of commodity;

(8) Gross weight in pounds and cubic feet if available;

(9) Total ocean freight in U.S. dollars; and

(10) Name of the steamship company.

(f) The Contractor agrees to provide with its final invoice under this contract a representation that to the best of its knowledge and belief --

(1) No ocean transportation was used in the performance of this contract;

(2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;

(3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or

(4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format:

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
TOTAL		

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h), in all subcontractors under this contract that--

(1) Exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation; and

(2) Are for a type of supplies described in paragraph (b)(3) of this clause.

(End of clause)

CONTRACT ADMINISTRATION DATA

The Contract Administration Office for this contract subsequent to award is:

Department of the Army
Los Angeles District, Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

ATTN: Ms. Tina Davis-Frazier
Telephone No: Area Code (213) 452-3252

Payment will be made by:

USACE Finance Center
ATTN: CEFC-AO-P
5270 Integrity Drive
Millington, TN 38054-5005

Submit Invoices to:

Refer to Block No. 26 of the Standard Form 1442, “Solicitation, Offer and Award” which will be completed at the time of contract award.

EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)
EFARS 52-231-5000

(a) Allowable costs for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense Schedule," Region VII. Working conditions shall be considered to be average for determining equipment rates 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.

(b) 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.

(c) 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 of pricing data submitted are accurate, complete and current.

(End of clause)

52.232-4001 CONTINUING CONTRACTS (ALTERNATE) (MAR 1995) EFARS 52-232-5002

(a) Funds are not available at the inception of this contract to cover the entire contract price. The sum of $1,250,000.00 has been reserved for this contract and is available for payment to the contractor during the current fiscal year. It is expected that Congress will make appropriations for future fiscal years from which additional funds, together with funds provided by one or more non-federal project sponsors will be reserved for this contract. The liability of the United States for payment beyond the funds reserved for this contract is contingent on the reservation of additional funds.

(b) Failure to make payment in excess of the amount currently reserved, or that may be reserved from time to time, shall not be considered a breach of this contract, and shall not entitle the contractor to a price adjustment under the terms of this contract except as specifically provided in paragraphs (e) and (h) below.

(c) The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The contracting officer will promptly notify the contractor of any additional funds reserved for the contract by issuing and administrative modification to the contract.

(d) If earnings will be such that funds reserved for the contract will be exhausted before the end of any fiscal year, the contractor shall give written notice to the contracting officer of the estimated date of exhaustion and of additional funds which will be needed to meet payments due or to become due under this contract during that fiscal year. This notice shall be given not less than 45 nor more than 60 days prior to the estimated date of exhaustion.

(e) No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract. If and when sufficient additional funds are reserved, the contractor shall be entitled to simple interest on any payment that the contracting officer determines was actually earned under the terms of this contract and would have been made except for exhaustion of funds. Interest shall be computed from the time such payment would otherwise have been made until actually or constructively made, and shall be at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 Stat 97, as in effect on the first day of the delay in such payment.

(f) Any suspension, delay, or interruption of work arising from exhaustion or anticipated exhaustion of funds shall not constitute a breach of this contract and shall not entitle the contractor to any price adjustment under a "Suspension of Work" or similar clause or in any other manner under this contract.

(g) An equitable adjustment in performance time shall be made for any increase in the time required for performance of any part of the work arising from exhaustion of funds or the reasonable anticipation of exhaustion of funds.

(h) If, upon the expiration of sixty (60) days after the beginning of the fiscal year following an exhaustion of funds, the Government has failed to reserve sufficient additional funds to cover payments otherwise due, the contractor, by written notice delivered to the contracting officer at any time before such additional funds are reserved, may elect to treat his right to proceed with the work as having been terminated. Such a termination shall be at no cost to the Government, except that, to the extent that additional funds to make payment therefore are allocated to this contract, it may be treated as a termination for the convenience of the Government.

(i) If at any time it becomes apparent that the funds reserved for any fiscal year are in excess of the funds required to meet all payments due or to become due the contractor because of work performed and to be performed under this contract during the fiscal year, the Government reserves the right, after notice to the contractor, to reduce said reservation by the amount of such excess.

(j) The term "Reservation" means monies that have been set aside and made available for payments under this contract.

(End of clause)

52.0239-4001 YEAR 2000 COMPLIANCE FOR CONSTRUCTION
PER CEPR (715) MEMORANDUM DATED 1 JUNE 1998
YEAR 2000 COMPLIANCE FOR CONSTRUCTION CONTRACTS

a. In accordance with FAR 39.106, the contractor shall ensure that with respect to any design, construction, goods, or services under this contract as well as any subsequent task/delivery orders issued under this contract (if applicable) all information technology contained therein shall be Year 2000 compliant. Specifically:

b. The contractor shall:

(1) Perform, maintain, and provide an inventory of all major components to include structures, equipment, items, parts, and furnishings under this contract and each task/delivery order which may be affected by the Y2K compliance requirement.

(2) Indicate whether each component is currently Year 2000 compliant or requires an upgrade for compliance prior to Government acceptance.

BASIS FOR SETTLEMENT OF PROPOSALS EFARS 52.249-5000

Actual costs will be used to determine equipment costs for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a terminations settlement proposal using the total costs basis, the following principals will be applied to determine allowable equipment costs:

(1) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.

(2) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.

(3) Recorded job costs adjusted for unallowable and unallowable expenses will be used to determine equipment operating expenses. [3]

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs age normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recover through the indirect expense rate.

(End of Statement)

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SECTION 01200

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM F 547	(1977; R 1995) Definitions of Terms Relating to Nail For Use with Wood and Wood-Based Materials

ASME INTERNATIONAL (ASME)

ASME B18.2.1	(1996) Square and Hex Bolts and Screws (Inch Series)
ASME B18.2.2	(1987; R 1993) Square and Hex Nuts (Inch Series)

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-2336	(Rev A) Primer Coating (Alkyd, Exterior Wood, White and Tints)
CID A-A-2962	(Rev A) Enamel, Alkyd (Metric)

DEPARTMENT OF COMMERCE (DOC)

DOC PS 1	(1996) Voluntary Product Standard - Construction and Industrial Plywood

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST PS 20	(1994; Addenda Jan. 1997) American Softwood Lumber Standards

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The

following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-09 Reports

Insurance Policies; FIO.

Copy of all policies in force.

Utilities to be Relocated or Protected; FIO.

Submit notification not less than 14 days prior to starting work on any utility.

Bench Marks and R/W Markers; FIO.

Submit notification not less than 7 calendar days prior to removal.

Clearing and Grubbing; FIO.

Submit notification not less than 7 calendar days prior to start of clearing and grubbing activities.

Spill Reporting; FIO.

Submit notification of spills immediately after spillage.

Record of construction as installed and completed within 14 calendar days of acceptance of the project by the Government.

Traffic Control Plan; FIO.

Submit approved plan prior to construction.

Accident Reporting; FIO.

Submit summary of worker's compensation claims.

Air Pollution Permit; FIO.

Submit copy of permit.

National Pollutant Discharge Elimination System; FIO.

Submit copy of plan and NOI.

Temporary Fencing Plans; GA.

Submit plans not less 30 calendar days after notice to proceed.

SD-04 Drawings

As-Built Drawings; GA.

Submit in accordance with paragraph: AS-BUILT DRAWINGS.

1.3 PROJECT FACILITIES

The Contractor shall construct and/or erect the following project facilities:

1.3.1 Construction Signs

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

a. Project Signs: One Project Sign at location designated by the Contracting Officer.

b. Warning Signs: Facing approaching traffic on all haul roads crossing under overhead power transmission lines.

c. Hard Hat Signs: Four hard hat signs at locations directed.

1.3.2 Bulletin Board

Immediately upon beginning work at the site, the Contractor shall provide a weatherproof glass-covered bulletin board, not less than 36 by 30 inches in size, with hinged glass door, 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.

1.3.3 Sanitary Facilities

Suitable sanitary facilities shall be provided and maintained by the Contractor.

1.3.4 Temporary Construction Fencing

Temporary construction fencing 1.5 meters high shall be erected in the locations indicated on the outlet channel drawings and per paragraph 3.17.3 below.

PART 2 PRODUCTS

2.1 CONSTRUCTION SIGNS

2.1.1 Materials

2.1.1.1 Lumber

Lumber shall conform to NIST PS 20, and shall be seasoned Douglas Fir, S4S, Grade D or better except that posts, braces and spacers shall be construction Grade (WCLB).

2.1.1.2 Plywood

Plywood shall conform to DOC PS 1, grade A-C, Group 1, exterior type.

2.1.1.3 Bolts, Nuts and Nails

Bolts shall conform to ASME B18.2.1, nuts shall conform to ASME B18.2.2, and nails shall conform to ASTM F 547.

2.1.1.4 Paints and Oils

Paints shall conform to CID A-A-2336 for primer and CID A-A-2962 for finish paint and lettering.

2.2 TEMPORARY CONSTRUCTION FENCING

Fencing material shall be chain link fabric with steel posts, of new or salvaged materials suitable for the intended purpose.

PART 3 EXECUTION

3.1 CONSTRUCTION OF SIGNS

3.1.1 Project and Hard Hat Signs

Project, hard hat, and safety signs shall be constructed as detailed on Figures 1, 2, and 3 attached at the end of this section. Decals will be furnished by the Contracting Officer.

3.1.2 Warning Signs

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 1 m above the ground. The sign face shall be 0.60 m x 1.20 m, all letters shall be 100 mm in height, and the wording shall be: "WARNING: OVERHEAD TRANSMISSION LINES."

3.2 PAINTING SIGNS

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.

3.3 PROJECT ENGINEER'S OFFICE EQUIPMENT

Contractor shall provide computer software (3.5" floppy disc size) to the Contracting Officer for the type of scheduling system to be used and quantity/fill programs for tracking or estimating bid quantities during construction. Scheduling software must be capable of downloading completely to the COE Standard Data Exchange Format. The Contractor shall utilize a hand held radio system for communication between the Contractor's quality control representative and the Government's quality assurance

representative. Radio equipment for the Government's use shall include a hand held radio, two batteries and one charger. The Contractor shall provide Government personnel with the following equipment for the duration of the contract: 1 Cellular telephone with voice mail, 2 nickel cadmium batteries, 1 desk top charger, 1 travel charger, and 400 minutes of air time per month or portion thereof.

3.4 TEMPORARY CONSTRUCTION FENCING

Temporary construction fencing shall be carefully erected, in a neat and workmanlike manner. Posts shall be plumb and in alignment. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance.

3.5 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.

3.6 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.

3.7 ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION

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

3.8 **3.8 PROTECTION OF EXISTING WORK**

Before beginning any cutting or removal work, the Contractor shall carefully survey the existing work and examine the drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to insure against damage to such work to remain in place, to be reused, or to remain the property of the Government, and any damage to such work shall be repaired or replaced as approved by the Contracting Officer at no additional cost to the Government. The Contractor shall carefully coordinate the work of this section with all other work and construct and maintain shoring, bracing and supports, as required. The Contractor shall insure that structural elements are not overloaded and be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or

demolition work performed under any part of this contract. The Contractor shall protect all survey monuments found within the lease area. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Comers, reference comers, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the Contractor shall immediately report the incident in writing to the Contracting Officer and the respective installing authority, if known. Where General Land Office or Bureau of Land Management monuments or references are obliterated during operations, the contractor shall secure the services of a registered land surveyor to restore the disturbed monument. The Contractor shall record the survey in the appropriate county and send a copy to Contracting Officer.

3.9 PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS

3.9.1 General

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

3.9.2 Relocation or Removal

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

3.9.3 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.

3.9.4 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.

3.9.5 Notices

3.9.5.1 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 7 days prior to the start of work in the vicinity of their respective utilities.

Mr. Bucky Faulkner
Clark County Sanitation District
5857 E. Flamingo road
Las Vegas, NV
Telephone: (702)434-6601

Mr. Tom Carden
Southwest Gas Corporation
4300 W. Tropicana Avenue
Las Vegas Nevada
(702)365-2180
Underground Service Alert
(800)227-2600

Kimberly Granath-Musil
Cox Communications
121 S. Martin L. King Blvd.
Las Vegas, NV 89106
(702)384-8084, ext 356

Mr. Dean Whitman
US Sprint
3300 S. Valley View Boulevard
Las Vegas, NV 89152
(702)244-7808

Ms. Tina Kelling
Nevada Power Company
6770 W. Flamingo Road
Las Vegas, NV 89151

(702)252-4815

3.9.5.2 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 existing bench mark or right-of-way marker.

3.9.5.3 Clearing and Grubbing

In order to satisfy the Environmental Assessment for this project, the Contracting Officer is required to have a qualified biologist on site at all times while clearing and grubbing operations are in progress. The Contractor shall notify the Contracting Officer 14 calendar days prior to the start of clearing and grubbing activities so that a biological monitor can walk immediately in front of the Contractors' clearing and grubbing equipment to survey for the threatened desert tortoise. For scheduling purposes, the Contractor shall coordinate and complete all clearing and grubbing activities within one workday period.

3.9.5.4 Spill Reporting

The Contractor shall notify the Contracting Officer immediately after any spill, regardless of quantity, including all personnel exposures. The Contractor shall submit a written notification not later than 7 calendar days after the initial notification. The written notification shall include the following:

a. Item spilled, leaked or releases in an unauthorized manner (Identification, Quantity and Manifest Numbers).

b. Whether the amount spilled, leaked or released in an unauthorized manner is EPA reportable and, if reported, a copy of the report.

c. Exact location of the spill, leak or unauthorized release.

d. Nature of exposure to personnel.

e. Containment procedures initiated.

f. Anticipated cleanup and disposal procedure.

g. Disposal location of spill, leak or unauthorized release residue.

3.9.6 Restrictions

3.9.6.1 Other Agency Representatives

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

3.9.6.2 Traffic Control Plan

The Contractor shall develop a Traffic Control Plan and obtain an approval from the Clark County Department of Public Works prior to construction. The plan shall include vehicular detour plans, details of truck haul routes, details of restripping and signage for vehicular circulation, and parking details.

Charleston Boulevard. The Contractor shall also develop a traffic control plan for work performed in the Charleston Boulevard (Highway 159) right-of-way as required by the State of Nevada Department of Transportation permit.

3.9.6.3 Existing Roads

The work shall be planned in such a manner that regular traffic on the existing roads outside actual construction areas shall be maintained at all times. The work area shall be examined carefully relative to the order and scope of work to be performed, with respect to the limiting provisions of the plans and specifications. The construction schedule shall be prepared giving full consideration to not impacting maintaining regular traffic on existing roads outside the construction limits. Additional work on the existing roads may be performed by others during the life of this contract.

3.9.6.4 Access and Haul Roads

All haul and access roads, within the construction area, including the borrow areas, shall be maintained to provide vehicular access for the Government's vehicles as well as Contractor's vehicles. Haul roads shall be proposed so that use of existing residential streets are minimized.

3.9.6.5 Public and Private Roads

When it is necessary to operate on existing roads outside the construction area, all necessary permits shall be obtained from the appropriate private or public authority. Work shall be conducted in such manner so as to obstruct and inconvenience traffic on existing roads outside the construction limits as little as possible. Spillage of earth, dusty materials, boulders, and mud on project roads or other road will not be permitted. If spillage cannot be prevented, the spillage shall be immediately removed and such areas shall be kept clear throughout the workday. At the conclusion of each workday, such traveled areas shall be cleared of spillage, boulders, and mud.

3.9.6.6 Maintenance of Roads

All haul and access roads, within the construction area, including the borrow areas, shall be maintained to provide vehicular access for the Government's vehicles and the Contractor's vehicles and equipment. Road maintenance shall include rock/mud slides, washouts, and any incident which would restrict vehicular/equipment access. Prior to any alterations of any road alignment, the Contractor shall receive an approval from the Contracting Officer. Road maintenance and alterations shall be performed by the Contractor at no additional cost to the Government.

3.9.6.7 Traffic Safety

In accordance with CONTRACT CLAUSE: ACCIDENT PREVENTION, signs, barricades, and warning devices shall be provided, installed, and maintained as are required for protection of vehicular traffic at any location where operations interfere with public roads. Signs, barricades, lights, and signals, shall be in conformance with Part VI of the U.S. Department of Transportation Manual on Uniform Traffic Control Devices for Streets and Highways.

3.9.6.8 Rock and Gravel

Rock and gravel for use on haul roads and other facilities may be obtained from any source within the excavation limits, borrow area, or stockpiles, that are within the project boundaries and are not designated for other use. The use of any such source shall be subject to approval by the Contracting Officer.

3.9.6.9 Cooperation with Others

The Contractor shall coordinate his activities and cooperate with other contractors as to not delay or interfere with their work.

3.9.6.10 Roller Compacted Concrete Inflow Structure

The contractor shall complete construction of the roller compacted concrete (RCC) inflow structure, wall structure, apron, and roadside channel by 1 June, 2001. All items required to be constructed prior to RCC placement between inflow structure Sta. 18+00 (+/-) and Sta. 21+68 (+/-), and roadside channel Sta. 10+88 (+/-) and Sta. 17+30 (+/-) shall be in place so RCC placement can be accomplished. These items shall include but not be limited to excavation and recompaction and compacted fill.

3.9.7 Working Hours

The Contractor shall restrict all construction activities to the following schedule:

Monday thru Friday	6:30 a.m. to 7 p.m.
Saturday	8:00 a.m. to 7 p.m.

No work will be permitted on Sundays or Federal Holidays without the prior written approval from the Contracting Officer.

Disposal area(s) and haul route(s) utilized by the Contractor may require restricted hauling hours. The Contractor is notified that hauling or disposal activities may be restricted to normal business hours (7 a.m. to 4 p.m.) in the event that such operations are considered to be disruptive to existing neighborhood safety and noise conditions. In the event that such a situation develops, the Contracting Officer shall notify the Contractor of restrictive hauling and/or disposal times. The Contractor shall develop their schedule for construction so that restrictive hauling times can be absorbed without extending the overall contract completion period.

3.9.8 Construction Water

There are no known developed sources for water at or in the immediate vicinity of the project site. The Contractor shall be responsible for obtaining water for construction purposes at no additional cost to the Government.

3.9.9 Identification of Vehicles

All the Contractor's vehicles shall display suitable permanent identification.

3.9.10 Construction Method Observation

Any construction method, plant, or piece of equipment used on this contract shall not be considered proprietary, and can be inspected or photographed at any time by the Government, regulatory agencies, or any group approved by the Government.

3.9.11 Contractor's Equipment

The planned method of transportation and operation of cranes and other heavy equipment to be used in the performance of this contract shall be submitted for approval by the Contracting Officer. The plan shall include the type, size, loadings of equipment, the proposed transportation routes, and work areas to be used on the project.

3.10 PUBLIC SAFETY

Attention is directed to the CONTRACT CLAUSE: PERMITS AND RESPONSIBILITIES. The Contractor shall provide temporary fencing, barricades, and/or guards, as required, to provide protection in the interest of public safety. Whenever the Contractor's operations create a condition hazardous to the public, he shall furnish at his own expense and without cost to the Government, such flagmen and guards as are necessary to give adequate warning to the public of any dangerous conditions to be encountered and he shall furnish, erect, or maintain such fences, barricades, lights, signs and other devices as are necessary to prevent accidents and avoid damage or injury to the public. Flagmen and guards, while on duty and assigned to give warning and safety devices shall conform to applicable city, county, and state requirements. Should the Contractor appear to be neglectful or negligent in furnishing adequate warning and protection measures, the Contracting Officer may direct attention to the existence of a hazard and the necessary warning and protective measures shall be furnished and installed by the Contractor without additional cost to the Government. Should the Contracting Officer point out the inadequacy of warning and protective measures, such action of the Contracting Officer shall not relieve the Contractor from any responsibility for public safety or abrogate his obligation to furnish and pay for those devices. The installation of any general illumination shall not relieve the Contractor of his responsibility for furnishing and maintaining any protective facility.

3.11 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.

3.11.1 Accident Reporting

In accordance with EM 385-1-1, the Contractor shall submit a written summary of worker's compensation claims which have been filled by worker's in connection with work on the project. The summary shall be submitted at the time when the work is approximately 50 percent complete and at project completion. The summary shall include all subcontractors. The Contractor's and subcontractor's compensation insurance carrier shall certify that the summaries are "correct and true".

3.12 PERMITS

3.12.1 General

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

3.12.2 Air Pollution Permit (APP)

The Contractor shall obtain an APP from the Clark County Health Department. A copy of the permit shall be submitted to the Contracting Officer. For further information, contact Ms. Cynthia Mikes at telephone number (702) 383-1276.

3.12.3 National Pollutant Discharge Elimination System (NPDES) Permit

The Contractor shall obtain a NPDES permit from the United States Environmental Protection Agency (USEPA) under the Nation Wide Permit (NWP) program, which requires that a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and maintained on-site throughout the construction period. A copy of the plan shall be submitted to the Contracting Officer. In accordance with the NWP, a minimum of two (2) days prior to the start of construction activities, the Contractor shall submit a Notice of Intent (NOI) with fees to the Nevada Division of USEPA. The NOI shall be submitted on the standard EPA Form 3510-6 (8-92), and copies shall be provided to the Contracting Officer. For further information, contact Mr. Robb Saunders at telephone number (775) 687-4670.

3.12.4 NDOT Occupancy Permit

The Contractor shall comply with all terms and conditions of the NDOT occupancy permit which provides restrictions concerning construction activities within NDOT Rights-of-Way and hauling materials to the Gun Club adjacent to State Highway 159.

3.13 NOTICE OF PARTNERSHIP

The Government intends to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance and intended to achieve completion within budget, on schedule, and in accordance with plans and specifications. This partnership would be bilateral in makeup, and participation will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by both parties and will be shared equally with no change in contract price. To implement this partnership initiative it is anticipated that within 60 days of Notice to Proceed the Contractor's on-site project manager and the Government's Resident Engineer would attend a two day partnership development seminar/team building workshop together with the Contractor's key on-site staff and key Government personnel. Follow-up workshop of 1 to 2 days duration would be held periodically throughout the duration of the contract as agreed to by the Contractor and Government.

3.14 AS-BUILT DRAWINGS

3.14.1 General

The Contractor shall prepare as-built drawings for the government. The as-built drawings 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 the event that 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 structures.

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, etc.

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

g. All changes or modifications that result from the final inspection.

The Contractor shall also provide the Clark County Flood Control District a final asbuilt Arc/Info compatible export file or a corrected Global Positioning System survey file on a 3.5 DOS formatted diskette delineating the boundary of the site. All files shall be in the NAD 27 datum and shall have the appropriate metadata delineating how the data were collected, when the data was collected, who collected the data, and other pertinent information. This information shall also be submitted to the Assistant Field Office Manager, Division of Lands Bureau of Land Management, Las Vegas Field Office.

3.14.2 Options

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

3.14.3 Preliminary As-built Drawings

The Contractor shall maintain two (2) sets of full size blueline prints marked-up in red, one for use by the Contractor and one for use by the Government, to show the as-built conditions. The sets of as-built prints shall be kept current and available at the job site at all times. Information to be included on these preliminary drawings shall conform to the requirements as stated above. Prior to submission of each monthly pay estimate, the Contracting Officer and the Contractor will jointly inspect the marked-up as-built prints. Failure to keep the as-built field data current shall be sufficient justification to withhold a percentage from the monthly pay estimate.

3.14.4 Submittal to Contracting Officer For Review and Approval

The Government will furnish the Contractor with compact disk(s) (CD-R) containing electronic copies of the contract construction drawing files. The electronic files will be in Microstation format (Microstation Computer-Aided Design and Drafting Program, Microstation SE). The Contractor shall give the Government two weeks notice prior to his need for the electronic drawing files. The Contractor shall use the electronic files to generate as-built drawings for the project. Not later than two weeks after acceptance of the project by the Government, the Contractor shall deliver to the Contracting Officer one (1) set of marked-up preliminary as-built drawings, two (2) full size sets of blueline prints and one (1) set of paper or mylar reproducible prints of the as-built drawings. The Contractor shall also submit compact disk(s) containing electronic copies of the as-built drawing files in the same Microstation format as the files furnished. If upon review, the drawings are found to contain errors and/or omissions, the Contractor will be notified and the electronic as-built drawing files will be returned to the Contractor for corrections. The Contractor shall complete the corrections and return two (2) sets of corrected as-built electronic drawing files on compact disk(s), and one (1) full size blueline print of the as-built drawings to the

Contracting Officer within ten (10) calendar days.

3.15 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15, 31 OCT 89)

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

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

(2) 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.

b. 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 DAYS
Work Days Based on five (5) Day Work Week

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
6	2	2	1	1	0	2	2	1	1	1	3

c. Upon acknowledgment 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 b, 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: DEFAULT (FIXED PRICE CONSTRUCTION).

3.16 REQUIRED INSURANCE

The Contractor shall procure and obtain during the entire period of his performance under this contract the following minimum insurance:

a. General Public Liability insurance for bodily injury and property damage with minimum limits of $1,000,000 combined single limit per occurrence and $1,000,000 annual aggregate for bodily injury to or death, personal injury and property damage.

b. Automobile Liability insurance for bodily injury and property damage with minimum limits of $1,000,000 combined single limit for each occurrence and $1,000,000 annual aggregate.

c. Either Workman's Compensation or Employer's Liability insurance with a minimum limit of $1,000,000.

In every case the insurance coverage shall amount to at least the limits stated above. However, where the Financial Responsibility Compulsory Insurance Law of the State in which the installation is located requires higher limits, the Automobile Liability Insurance Policy should provide coverage of at least those limits. County of Clark, a political subdivision of the state of Nevada, Clark County Regional Flood Control District, and Montgomery Watson shall be named as additional insured parties and all policies issued in performance of work under this contract.

The Contractor does hereby agree to indemnify, defend, and save harmless Clark County, Clark County Regional Flood Control District, U.S. Army Corps of Engineers and Montgomery Watson from loss, damage, liability, costs, or expense to the proportionate extent caused by the Contractor, his employees, agents, or consultants and/or consultants arising out of its performance of this contract, including, but not limited to the negligent acts, errors, omissions, or intentional misconduct of the Contractor, its employees, agents or consultants and/or subconsultants in connection with this contract.

Contractor further does hereby agree, as a precaution to the performance of any work under this contract and as a precaution to any obligation of Clark County to make any payment under this contract, to provide Clark County with a certificate and/or a certificate issued by the State Industrial Insurance System (SIIS) in accordance with Nevada Revised Statute 616.280.

Contractor agrees to maintain required workers compensation throughout the entire term of the contract. If Contractor does not maintain coverage throughout the entire term of the contract, Contractor agrees that Owner may, at any time the coverage is not maintained by Contractor, order the Contractor to stop work, assess liquidated damages as defined herein, suspend the contract, or terminate the contract. For each six month period this contract is in effect, Contractor agrees, prior to the expiration of the six month period, make another written request to SIIS for the provisions of a certificate and notice of lapse in or nonpayment of coverage. If Contractor does not make the request or does not provide the certificate before the expiration of the six month period, Contractor agrees that owner may order the Contractor to stop work, suspend the contract or terminate the contract.

3.17 BLM RIGHT-OF-WAY GRANT STIPULATIONS

3.17.1 Desert Varnish Coloring and weed removal

Following completion of construction downstream of the existing embankment, disturbed lands, filled areas, and structures shall blend into the natural color of the surrounding lands through the surface application of a desert varnish coloring material as shown on the drawings and specifications section 02950 SIMULATED DESERT VARNISH ROCK COLOR MITIGATION. The desert varnish shall be an artificially accelerated, single-step oxidation process to simulate natural desert colors or similar process as approved by the Contracting Officer. The Contractor keep all disturbed areas, fill areas and cut areas clear of weeds during the entire construction period until project completion has been accepted by the Clark County Flood Control District.

3.17.2 Surface Disturbances and Temporary Fencing for Outlet Channel

Temporary fencing is required around disturbed areas within the outlet channel work and is not required for the scour protection work unless directed by the Contracting Officer. Within these areas, no surface disturbance shall be permitted further than 6.1 meters (twenty feet) from the access roadways, approved haul routes, fill areas within the wash, the waste pile area, and the headwall and apron. Ground disturbance including use by construction equipment shall be limited to a maximum of 6.1 meters (twenty feet) outside these structures. This boundary shall be marked by the installation of temporary fencing to prevent entry into the closed area. The temporary fencing plans shall be submitted to the Contracting Officer for approval.

3.17.3 Pesticides

The use of Pesticides will be permitted in accordance with all local laws and within the requirements of these specifications and through written approval of the Contracting Officer. Contractor shall provide a plan that shows the type and quantity of material to be used, pest(s) to be controlled, method of application location of storage and disposal of containers and any other information deemed necessary by the Contracting Officer. The plan shall be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year. Pesticides shall not be permanently stored on public lands authorized for use under this grant.

3.17.4 Waste removal

No material shall be placed or stored within the Public R/W at any time during or after the project construction. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an approved waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, construction waste, petroleum products, ashes and equipment.

3.17.5 Loading operations

All loading operations shall not exhibit an opacity greater than ten

percent for a period or periods aggregating more than three minutes in a sixty minute period. All loaded trucks leaving the site shall be watered down and covered to reduce emissions of PM10.

3.17.6 **3.17.6 limitations**

All Contractor's vehicles and construction equipment shall conform to the emissions limitations allowed under the permits issued by the Clark County Health District.

3.18 SPECIAL CONSTRUCTION REQUIREMENTS

The Contractor shall restrict his operation and adapt his construction schedule to accommodate the following:

3.18.1 Project Limits

The Contractor's work, employee parking, operations, staging, equipment assembly and maintenance, and other on-site activities shall be restricted to actual areas of construction within the Project Limits. The Project Limits of the Red Rock Outlet Channel are indicated on the drawings, and constitute the maximum limits of the construction area available for Contractor's operations. The Project Limits are generally defined by the Right-of-Way (R/W) and adjoining Temporary Construction Easements (TCE) as shown on the plans, unless designated otherwise (either in the plans, in these Specifications or by the Contracting Officer).

The Contractor shall be solely responsible for obtaining agreements with and acquisition from adjacent land owners, when additional land or access points are required to supplement the Contractor's operations or staging needs. No appurtenances or other public access facilities (either temporary or permanent) shall be constructed beyond the Project Limits.

3.18.2 Existing Roads

3.18.2.1 Country Cove Court

The Contractor shall maintain public access along Country Cove Court at all times during this contract. Signs and reflective barriers are to be used as required to allow safe passage. The Contractor shall not use Country Cove Court as an entrance or exist to the project site.

3.18.2.2 Green Mountain Court

The Contractor shall maintain public access along Green Mountain Court at all times during this contract. Signs and reflective barriers are to be used as required to allow safe passage.

3.18.3 Coordination with Other Contractors

3.18.3.1 Red Rock Country Club at Summerlin

The Contractor is advised that Red Rock Country Club at Summerlin is

currently under construction. Construction is ongoing for a period of five years based on new home sales. Work to be performed under that contract consists of construction of Red Rock Homes Subdivision. Additional information may be obtained on this subdivision development contract from the Land Development Manager, David Firestone at telephone (702) 360-0468.

3.18.4 Diversion and Control of Water

The Contractor is responsible for control of storm flows during construction. The estimated 100-year discharge from the detention basin to the Red Rock Outlet Channel is 5.1 cubic meters per second. In addition to flow released from the detention basin, the surrounding area contributes runoff that increases the 100-year flow in the project area to 13.0 cubic meters per second. The Contractor shall describe the method of control for these flows in the diversion and control of water plan required as part of Section 02100 DIVERSION AND CONTROL OF WATER.

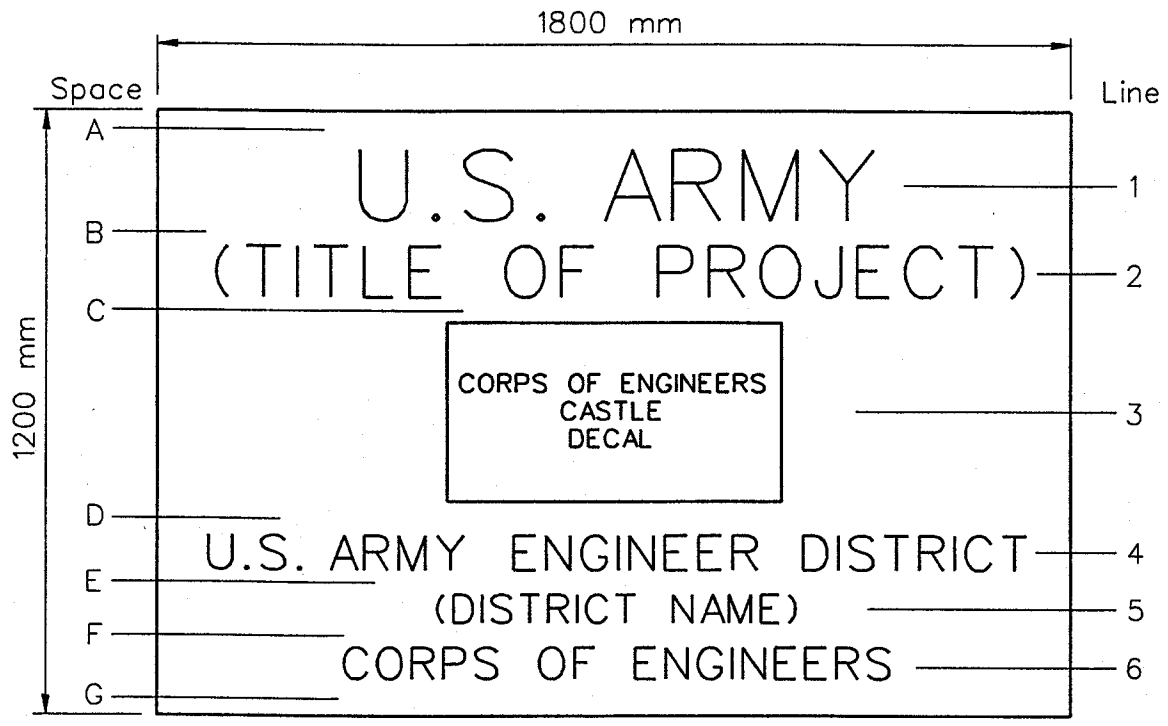
3.18.5 Minimize Existing Facility Exposure

The contractor shall minimize existing facility exposure by replacement work immediately following demolition work. For example, the demolition of the existing headwall shall be followed by the construction of the new pipe connection to the existing pipe and the laying of new pipe, in a continuos operation.

3.19 EXCAVATED MATERIALS AND DISPOSAL SITE BERM CONSTRUCTION

All suitable excavated materials including suitable waste pile removal materials shall be hauled to a location on the scour protection site and processed for usage as RCC material, compacted fill, miscellaneous fill, miscellaneous fill for berms, and berm facing material. Prior to hauling any material to the Disposal Site, the Contractor shall verify with the Contracting Officer that the quantities of materials necessary to complete the construction of the entire scour protection work and entire outlet channel work have been processed including materials for RCC, compacted fill, and miscellaneous fills. The Disposal Site Berm Construction shall be started and completed within a 90 day period. The Contractor shall not perform any work on the Disposal site during weekends. The Contractor shall notify the Contracting Officer 14 days prior to beginning any Disposal Site work to verify sequence of the construction of the disposal site berms. Berms shall be constructed sequentially until all available berm materials have been depleted. The berm construction shall be adjusted as required by the Contracting Officer.

-- End of Section --



Space	Height	Line	Description	Letter Height	Stroke
A	75				
		1	U.S. ARMY	140	22
B	50				
		2	PROJECT NOMENCLATURE	100	16
C	50				
		3	CORPS OF ENGINEERS CASTLE (DECAL)	345	
D	70				
		4	U.S. ARMY ENGINEER DISTRICT	70	9
E	50				
		5	DISTRICT NAME	60	6
F	50				
		6	CORPS OF ENGINEERS	65	9
G	75				

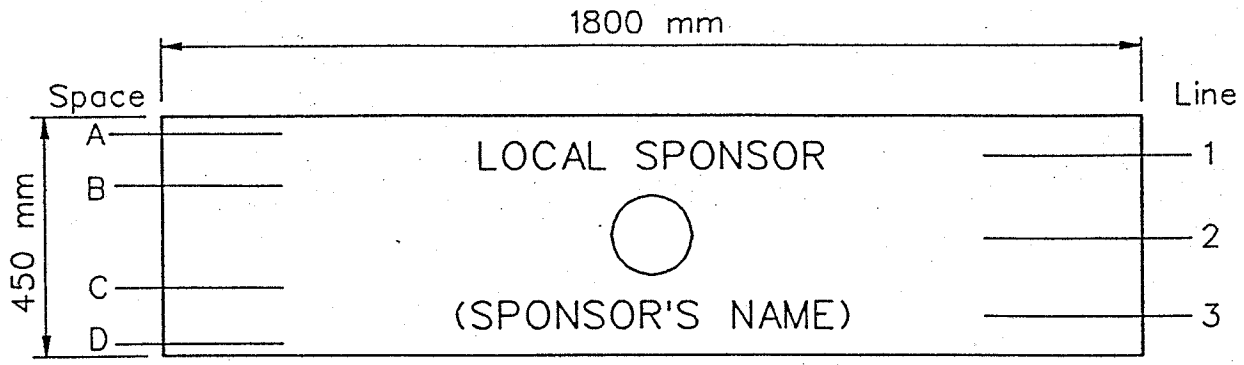
Letter Color -- Black

PROJECT SIGN
(Army-Civil Works)

Figure 1
October 1996

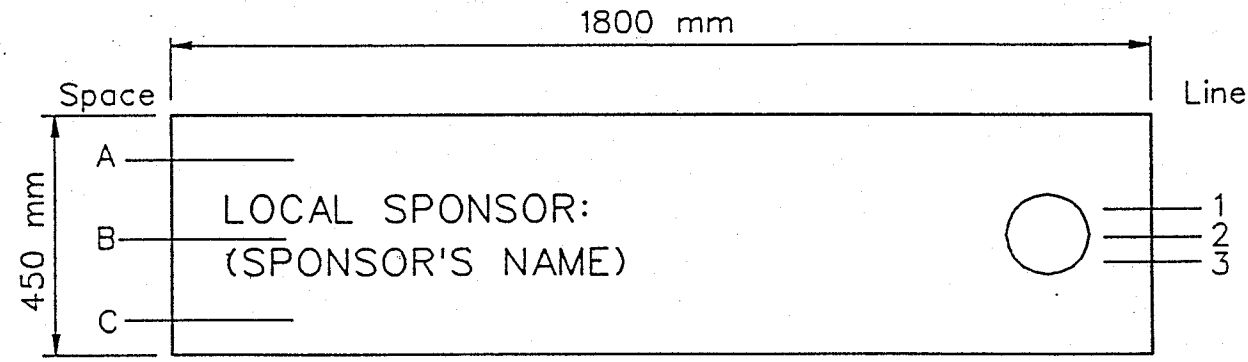
All units are in millimeters.

...\dredging\dgn\1999\sign.dgn Mar. 07, 2000 12:42:03



Space	Height	Line	Description	Letter Height	Stroke
A	50				
		1	LOCAL SPONSOR	50	9
B	50				
		2	SPONSOR'S EMBLEM (DECAL)		
C	50				
		3	(SPONSOR'S NAME)	50	9
D	50				

- OR -

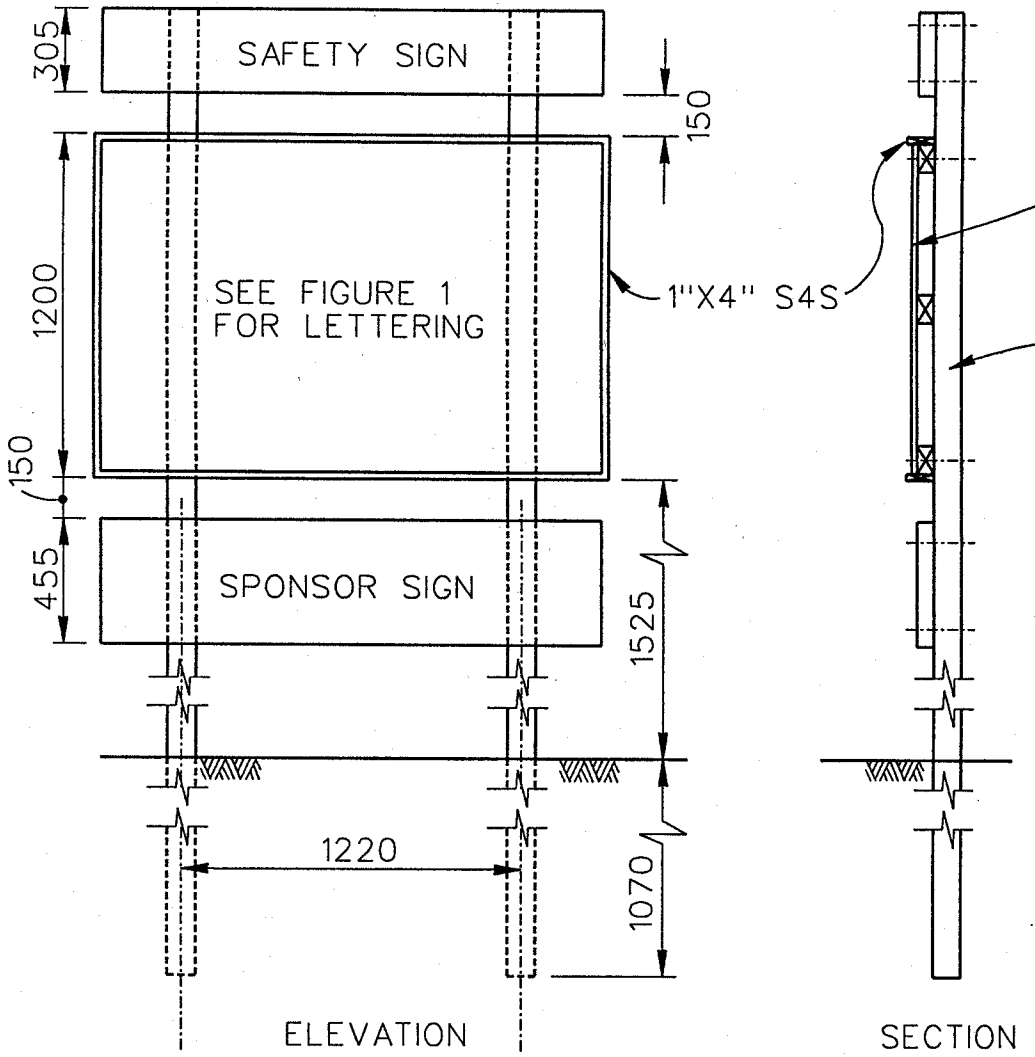


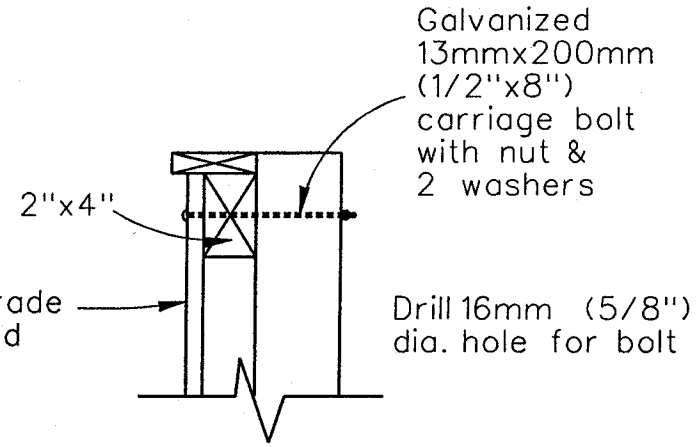
Space	Height	Line	Description	Letter Height	Stroke
A	150				
		1	LOCAL SPONSOR	50	9
B	50	2	SPONSOR'S EMBLEM (DECAL)		
		3	(SPONSOR'S NAME)	50	9
C	150				

Lettering Color -- Black

All units are in millimeters.

Figure 1A
October 1997





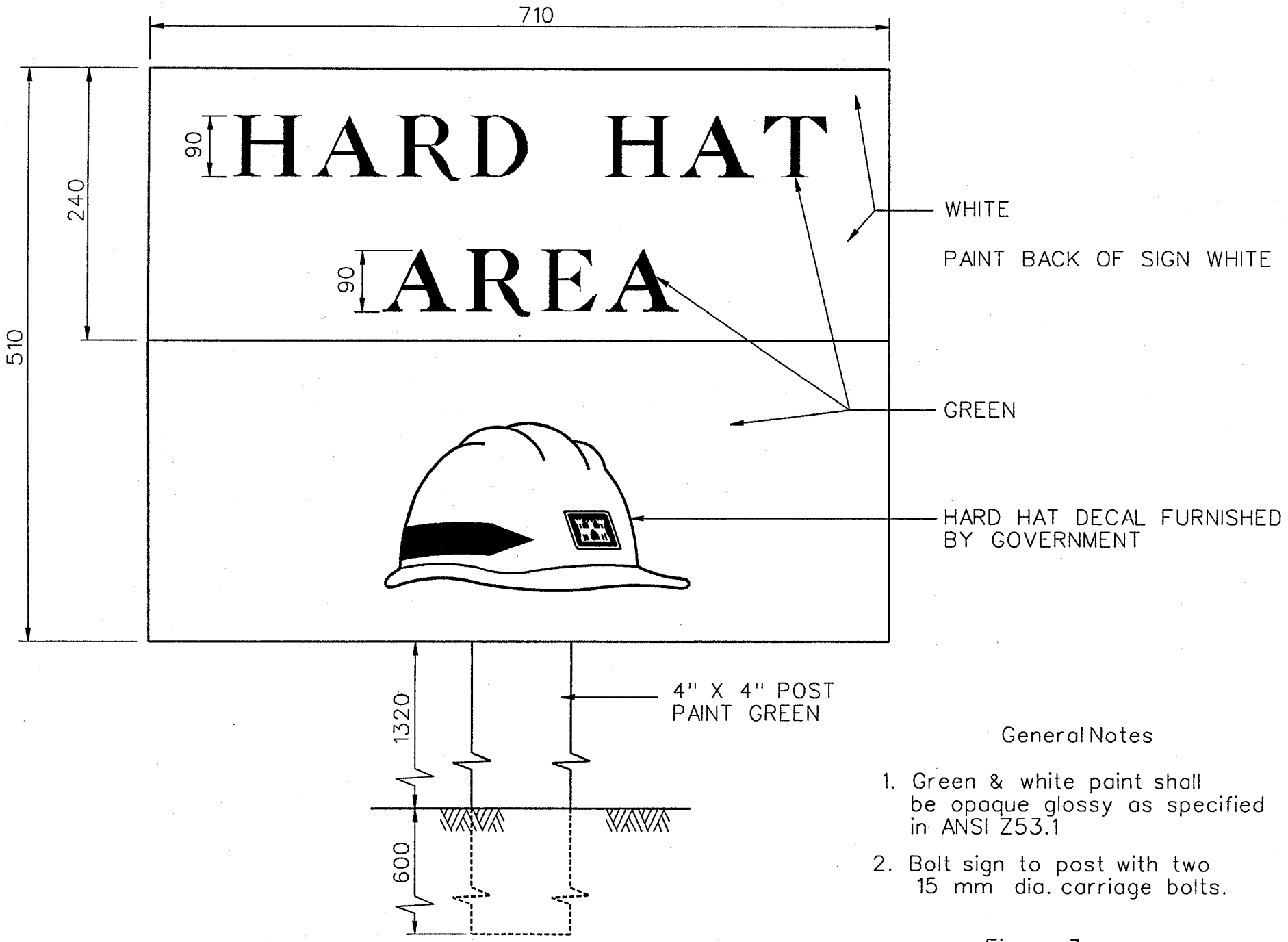
General Notes

1. Lumber to be cut & formed accurately.
2. Secure 1"x4" & plywood with 6d finish nails at not less than 305mm(12") O.C.
3. All exposed nails to be set & holes filled with putty.
4. Sign to be set in good solid ground & backfill carefully tamped into place.
5. Where necessary, posts shall be braced to provide a solid installation.

SIGN DETAILS

Figure 2
October 1996

All units are in millimeters unless otherwise indicated.



General Notes

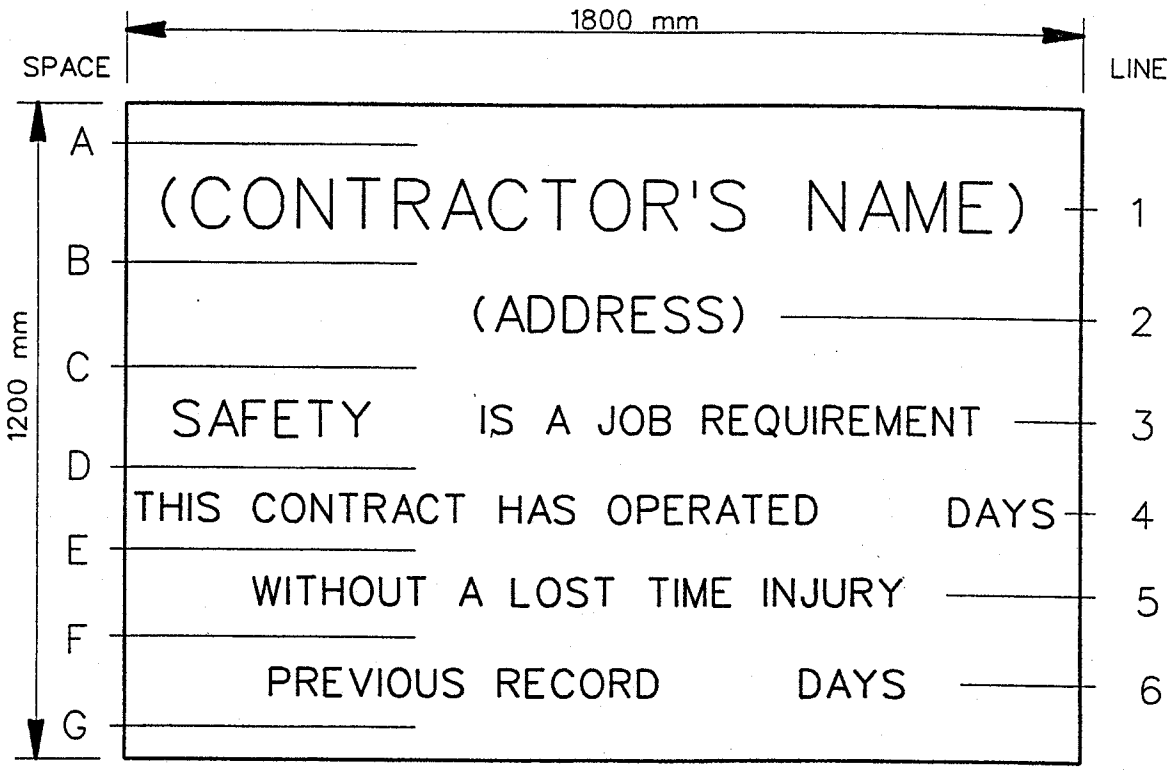
1. Green & white paint shall be opaque glossy as specified in ANSI Z53.1
2. Bolt sign to post with two 15 mm dia. carriage bolts.

All units are in millimeters unless otherwise indicated.

Figure 3
October 1996

CORPS OF ENGINEERS

U.S. ARMY



SPACE	HEIGHT	LINE	DESCRIPTION	LETTER HEIGHT
A	125			
		1	CONTRATOR'S NAME	125
B	75			
		2	ADDRESS	75
C	150			
		3	SAFETY IS A JOB REQUIREMENT	115 & 75
D	75			
		4	ALL LETTERING	75
E	75			
		5	ALL LETTERING	75
F	75			
		6	ALL LETTERING	75
G	125			

Notes

Lettering shall be black No. 27038 standard 595.
Sign shall be installed in the same manner as the Project Sign.

All units are in millimeters.

SAFETY SIGN
STANDARD DETAIL

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01250

MEASUREMENT AND PAYMENT (SCOUR PROTECTION)

SECTION 01250

MEASUREMENT AND PAYMENT (SCOUR PROTECTION)

PART 1 GENERAL

1.1 GENERAL

The contract price and payment shall constitute full compensation as stated in the Contract Clause, CONTRACT PRICES - BIDDING SCHEDULES, for completion of the work. No separate payment will be made for any material or work necessary to complete the work that is not specifically mentioned, such materials and work shall be considered incidental to all bid items. As stated in Contract Clause, SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, the word "provided" shall be understood to mean "furnished and installed" when used in this section or elsewhere in the technical sections.

1.2 DIVERSION AND CONTROL OF WATER

Payment for Diversion and Control of Water will be made at the applicable contract price, which payment shall constitute full compensation for control of storm water runoff to prevent adverse impacts to the project or downstream properties and maintenance of the work area in a dry condition.

1.3 CLEAR SITE AND REMOVE OBSTRUCTIONS

Payment shall include all costs for clearing, removal, replacement, and restoration work (except work by others) including all existing obstructions within the construction work area. Except as otherwise specified, payment for clearing and removal work includes applicable earthwork; grubbing; filling holes; removal of materials for salvage; removal of existing surface trash and debris and removal of trees and vegetation from within areas to be excavated and areas to receive fills, structures and stockpiles; protection, replacement or restoration of existing structures and features indicated and disposal of all materials.

This payment item shall include all work necessary to remove the existing temporary stone slope protection and heavy riprap. The approximate limits of temporary stone slope protection is indicated on the drawings and the Contractor shall satisfy for their self the quantity and effort required to clear, remove, and salvage the existing temporary stone slope protection and heavy riprap.

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.

1.4 EXCAVATION

1.4.1 Measurement

A survey of the site shall 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 survey. 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. The Contractor has the option of using computer methods for quantity estimations, but all computer methods of quantity estimations shall be approved by the Contracting Officer. All excavation outside of excavation lines shown on the drawings will be considered as being for convenience of the Contractor.

1.4.2 Payment

Payment for Excavation will be made at the applicable contract price, which payment shall constitute full compensation for excavation for the inflow channel and structure, the roadside channel, basin and other areas as indicated on the drawings, cemented alluvium excavation; shaping and trimming of areas to receive riprap, filter material, and roller compacted concrete; loading, stockpiling, crushing, processing, hauling, and dumping suitable materials for fills for the inflow channel and structure, the roadside channel; loading, stockpiling, hauling, placing and grading excess satisfactory excavated materials in the graded basin area as shown on the drawings or as directed; and any costs associated with offsite disposal of unsatisfactory excavated materials, complete. Payment will not be included for excavation (including shoring) outside the excavation limits indicated on the drawings or staked in the field, and other earthwork requirements for which separate payments are provided.

1.4.2.1 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.

1.4.2.2 Unsatisfactory Soils

No separate payment will be made for the excavation, hauling, and disposal of unsatisfactory soils. When such excavation is directed, payment therefore will be included in the applicable contract price for the items of work under which the unsatisfactory soils are encountered. When there is no applicable contract item an adjustment will be made. Refer to Section 02200 EXCAVATION for definition of unsatisfactory soils.

1.4.2.3 Excavation for Structures

No separate payment will be made for excavation, overexcavation or recompaction of the subgrade base and backfill for structures. The limits

of excavation and recompaction for structures are shown on the plans and details and specified herein. All costs therefore shall be included in the applicable contract item to which the work applies.

1.4.2.4 Shoring

When shoring is indicated or directed for items for which separate payment is made, payment will be included in the applicable contract price for the items of work under which the shoring is placed.

1.5 COMPACTED FILL

1.5.1 Measurement

Measurement 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 or staked in the field. 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. The Contractor has the option of using computer methods of quantity estimation, but all computer methods of quantity estimation shall be approved by the Contracting Officer.

1.5.2 Payment

1.5.2.1 Compacted Fill

Payment for Compacted Fill will be made at the applicable contract price, which payment shall constitute full compensation for watering, shaping, grading, and compacting the fills complete.

1.5.2.2 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 items to which the work applies.

1.6 FILTER MATERIAL

1.6.1 Measurement

Measurement of Filter Material will be by the cubic yard of filter material placed within the lines and grades indicated on the drawings or as directed.

1.6.2 Payment

Payment for Filter Material will be made at the applicable contract price which payment shall constitute full compensation for furnishing and placing the filter material, complete including subgrade preparation.

1.7 RIPRAP AND STONE PROTECTION

1.7.1 Measurement

The quantity of Riprap and Stone Protection to be paid for will be the number of tons (2,000 pounds), determined by scale weights, acceptably placed within the lines and grades shown on the drawings or directed by the Contracting Officer.

1.7.2 Payment

Payment for Riprap and Stone Protection, of the various types will be made at the applicable contract unit prices, per ton (2,000 lbs), which payment shall constitute full compensation for furnishing and placing the riprap and stone protection, complete.

1.8 ROLLER-COMPACTED CONCRETE

1.8.1 Measurement

Measurement of Roller-Compacted Concrete will be made on the basis of actual cubic yards of Roller-Compacted Concrete placed within the lines and grades indicated on the drawings.

1.8.2 Payment

Payment for Roller-Compacted Concrete will be at the applicable contract price, which payment shall constitute full compensation for the Roller Compacted Concrete including all materials (except Portland cement and pozzolan for which separate payments is provided), formwork, batching, hauling, placing, compacting, finishing, curing and all equipment and tools to complete the roller compacted concrete in place. Embedded items shall be included in the cost of the roller-compacted concrete except when other payment is specifically provided.

1.9 PORTLAND CEMENT

1.9.1 Measurement

Quantity of Portland Cement to be paid for will be the number of tons (2,000 pounds) of Portland cement used for roller compacted concrete unless specifically excepted, wasted or used for the convenience of the contractor. The quantity to be paid for will be determined by multiplying the approved weight of Portland cement in pounds per cubic yard of roller compacted concrete by the number of accepted cubic yards of roller compacted concrete placed within the lines and grades indicated on the drawings and dividing by 2,000.

1.9.2 Payment

Payments for Portland Cement for Roller Compacted Concrete will be made at the applicable contract price, which payment shall constitute full compensation for furnishing the Portland cement ready for use in the work, complete. No payment will be made for Portland cement used for structures for which separate payment is provided.

1.10 POZZOLAN

1.10.1 Measurement

Quantity of Pozzolan to be paid for will be the number of tons (2,000 pounds) of pozzolan used for Roller Compacted Concrete. The quantity to be paid for will be determined by multiplying the approved weight of pozzolan in pounds per cubic yard of roller compacted concrete by the number of accepted cubic yards of roller compacted concrete placed within the lines and grades indicated on the drawings and dividing by 2,000.

1.10.2 Payment

Payments for Pozzolan for Roller Compacted Concrete will be made at the applicable contact price, which payment shall constitute full compensation for furnishing the pozzolan, complete. No payment will be made for pozzolan used for structures for which separate payment is provided.

1.11 AGGREGATE BASE COURSE

1.11.1 Measurement

Measurement of Aggregate Base Course will be by the ton of aggregate base course placed within the lines and grades indicated on the drawings.

1.11.2 Payment

Payment for Aggregate Base Course will be made at the applicable contract price which payment shall constitute full compensation for furnishing and placing aggregate base course, complete including subgrade preparation.

1.12 ACCESS GATES

Payment for Access Gates will be made at the applicable contract price, per each, which payment shall constitute full compensation for fabricating and installing the gates, complete, including applicable earthwork and concrete as indicated on the drawings.

1.13 TEMPORARY TORTOISE FENCING

1.13.1 Measurement

Measurement of Temporary Tortoise Fencing will be by the linear feet of temporary tortoise fencing constructed as directed by the Contracting Officer and in accordance with section 02832 TEMPORARY TORTOISE FENCING.

1.13.2 Payment

Payment for Temporary Tortoise Fencing will be made at the applicable contract price, which payment shall constitute full compensation for temporary tortoise fencing, including applicable earthwork, posts, steel mesh fabric, tension wire, tie wire, fabrication and installation of tortoise proof gates, concrete, and all incidentals, complete. Payment for Temporary Tortoise Fencing will also include compensation for maintaining and repairing the tortoise fencing during construction and the removal and disposal of the temporary tortoise fencing and gates at the end of

construction of the Red Rock Detention Basin.

1.14 PIPE SAFETY RAILING

1.14.1 Measurement

Measurement of Pipe Safety Railing will be by the linear feet of pipe safety railing constructed as indicated on the drawings or as directed.

1.14.2 Payment

Payment for Pipe Safety Railing will be made at the applicable contract price, which payment shall constitute full compensation for fabricating and installing pipe safety railing, including pipe railing, expansion joint, and post, grout or dry pack, and all incidentals, complete

1.15 PIPE BOLLARDS

Payment for Pipe Bollards will be made at the applicable contract price, per each, which payment shall constitute full compensation for fabricating and installing pipe bollards, complete, including coring of the roller compacted concrete and concrete as indicated on the drawings.

1.16 SOIL STABILIZATION

1.16.1 Measurement

Measurement of the Soil stabilizer will be by the acre placed in accordance with the specifications

1.16.2 Payment

Payment for dust control soil stabilizer will be made at the applicable contract price, which payment shall constitute full compensation for the soil stabilizer, including furnishing the material, loading, hauling, placing and incidentals necessary for doing all the work involved in placing the stabilizer where specified or established by the Contracting Officer.

1.17 DISPOSAL SITE MISCELLANEOUS FILLS FOR BERMS

1.17.1 Measurement

Measurement for Disposal Site Miscellaneous Fills For Berms will be made between the ground lines and fill lines, as indicated or staked in the field. 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. The Contractor has the option of using computer methods of quantity estimation, but all computer methods of quantity estimation shall be approved by the Contracting Officer.

1.17.2 Payment

Payment for Disposal Site Miscellaneous Fills For Berms will be made at the applicable contract price, which payment shall constitute full compensation for processing all fill material, loading, hauling, placing, shaping, grading, and compacting, complete as shown on the drawings and shall include any field adjustments to the Berm's location, shape, size, or geometry as directed by the Contracting Officer not to exceed the total berm fill quantities as shown on the drawings.

1.18 DISPOSAL SITE FACING MATERIAL FOR BERMS

1.18.1 Measurement

Measurement for Disposal Site Facing Material For Berms will be made between the finished surface of the miscellaneous fill lines and the finished surface of the facing material, as indicated or staked in the field. 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. The Contractor has the option of using computer methods of quantity estimation, but all computer methods of quantity estimation shall be approved by the Contracting Officer.

1.18.2 Payment

Payment for Disposal Site Facing Material For Berms will be made at the applicable contract price, which payment shall constitute full compensation for processing all facing material, hauling, placing, shaping, and grading, complete as shown on the drawings and shall include any field adjustments to the Berm's location, shape, size, or geometry as directed by the Contracting Officer not to exceed the total berm facing quantities as shown on the drawings.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 01251

MEASUREMENT AND PAYMENT (OUTLET CHANNEL)

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SECTION 01251

MEASUREMENT AND PAYMENT (OUTLET CHANNEL)

PART 1 GENERAL

1.1 GENERAL

The contract price and payment shall constitute full compensation as stated in the Contract Clause, CONTRACT PRICES - BIDDING SCHEDULES, for completion of the work. No separate payment will be made for any material or work covered in this specification, but not specifically mentioned as part of a bid items, and all costs into which the work pertains or considered incidental to all bid items. As stated in Contract Clause, SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, the word "provided" shall be understood to mean "furnished and installed" when used in this section or elsewhere in the technical sections.

1.2 TRAFFIC CONTROL

Payment for Traffic Control will be made at the applicable contract price, which payment shall constitute full compensation for traffic control including but not limited to earthwork and grading for construction and removal of temporary roadways; providing safety barriers; providing traffic warning and control signs and flagmen as required.

1.3 DIVERSION AND CONTROL OF WATER

Payment for Diversion and Control of Water will be made at the applicable contract price, which payment shall constitute full compensation for control of storm water runoff to prevent adverse impacts to the project or downstream properties and maintenance of the work area in a dry condition.

1.4 **1.4 CLEAR SITE AND REMOVE OBSTRUCTIONS**

Payment for Clear Site and Remove Obstructions will be made at the applicable contract price, which payment shall constitute full compensation for clearing and grubbing areas of excavation, fill, or other approved areas necessary for the Contractor's operations within the limits of the designated temporary construction easement, the removal of debris, the removal of existing fencing, the protection of existing facilities to remain in place, and any necessary restoration. Unnecessary clearing will not be permitted. Organic materials resulting from the clearing and grubbing operations shall be hauled away from the project site. This works shall also include disposal off-site of all existing debris such as old pavement, tree trimmings, trash, etc. Surface soils stripped during clearing operations, and removed of organic material to the satisfaction of the Contracting Officer, shall remain on site and shall be used in areas of miscellaneous fill. This work shall also include the protection in place, or restoration, of existing facilities that are to remain in place. Removal

and salvage of riprap, and removal of existing pipe and existing trash rack, shall not be included in this item, but shall be included under items for demolition.

1.5 EXCAVATION

1.5.1 Measurement

A survey of the site shall be made prior to commencement of the work with cross-sections at a maximum spacing of 30 meters and at abrupt changes in existing grade. Measurements will be based on this survey and the lines and grades shown on the plans. If the survey does not vary from the topographic information shown on the plans, that would effect a change in quantities greater than 10%, the quantities included in the bid schedule, plus or minus any authorized changes shall be the quantities used for payment. Such quantities are based on differences between the original plan contours and finished grades as determined by digital terrain modeling software with a grid size of 0.5 meters. The actual slopes as excavated may be greater 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.

Where the unsatisfactory soils are encountered, the quantity of directed excavation necessary for the removal of unsatisfactory foundation material shall be included in the measurement for excavation.

Adjustments in quantities will be computed in cubic meters by the average end area method. All excavation outside of excavation lines shown on the drawings, or as directed, will be considered as being for convenience of the Contractor.

1.5.2 Payment

Payment for excavation will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for excavating the Red Rock Outlet Channel, and other areas as indicated on the drawings, except trench excavation for installation of pipe and removal of debris pile. Payment for pipe trench excavation shall be included in the unit prices for reinforced concrete pipe. **Waste Pile Disposal removal** is a separate bid item. Payment shall include rock removal, and cemented alluvium excavation; shaping and trimming, subgrade preparation for channel, loading, hauling, stockpiling, crushing or otherwise processing suitable materials for all fills; and any costs associated with disposal of excess excavated materials in areas other than those shown on the drawings, complete. Payment will not be included for excavation outside the excavation limits indicated on the drawings or staked in the field, and other excavation requirements for which separate payments are provided.

1.5.2.1 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 excavation or the items to which the work applies.

1.5.2.2 Unsatisfactory Soils

No separate payment will be made for the excavation and disposal of unsatisfactory soils. When such excavation is directed, payment will be made based on the contract unit prices for excavation and fills.

1.5.2.3 Excavation for Structures

No separate payment will be made for excavation for structures such as manholes and headwalls. All costs therefore shall be included in the applicable contract item to which the work applies.

1.5.2.4 Trenches

No separate payment will be made for excavation of pipe trenches. All costs therefore shall be included in the applicable contract prices for the items to which the work applies.

1.5.2.5 Shoring

No separate payment shall be made for shoring. The Contractor shall be responsible for method of construction and the use of shoring, stable slope cuts, or other trench safety requirements.

1.6 DEMOLITION

1.6.1 Measurement

1.6.1.1 Demolition - Existing Riprap

Removal of the existing riprap, grouted riprap, and any filter or bedding material will be as shown on the drawings. The estimated quantity shown on the plans shall be the basis for payment. The work shall include excavating, loading, hauling, any temporary stockpiling, and properly placing of existing riprap in miscellaneous fill areas.

1.6.1.2 Demolition - Existing 2.438 m Cast-in-Place Concrete Pipe

Demolition of the existing 2.438 m CIP shall be at the location shown on the drawings. The Work shall include removal, hauling, and disposal of the trash rack, concrete headwall and slab, and the existing 2.438 m CIP where shown on the drawings. The existing pipe shall be saw cut with a wet saw at the proper location. Proper care shall be taken not to disturb the subgrade or pipe, that is to remain.

1.6.2 Payment

1.6.2.1 Demolition - Existing Riprap

Payment for removal of riprap will be made at the applicable contract price, which payment shall constitute full compensation for removing riprap, grouted riprap, and any filter or bedding material within the areas shown on the drawings. Payment will include excavating, loading, hauling, stockpiling, and properly placing of materials in miscellaneous fill

areas, as necessary to complete the work. Payment will not be included for demolition outside the limits indicated on the drawings or staked in the field, and other demolition requirements for which separate payments are provided. Separate payment will be made for placement of salvaged suitable riprap for channel lining.

1.6.2.2 Demolition - Existing 2.438 m Cast-in-Place Concrete Pipe

Payment for the demolition of the 2.438 m CIP will be made at the applicable contract price, which payment shall constitute full compensation for the demolition of the structure as shown on the drawings, including removal, loading, hauling and disposal of the trash rack, concrete headwall and base slab and footings, and the existing 2.438 m CIP where shown on the plans. Payment will not be included for demolition outside the limits indicated on the drawings or staked in the field, and other demolition requirements for which separate payments are provided.

1.7 FILLS

1.7.1 Measurement

A survey of the site shall be made prior to commencement of the work, with cross-sections at a maximum spacing of 30 meters and at abrupt changes in grade. Measurements will be based on this survey and the finished lines and grades shown on the plans. If the survey does not vary from the topographic information shown on the plans, that would effect a change in quantities greater than 10%, the quantities included in the bid schedule, plus or minus any authorized changes shall be the quantities used for payment. Such quantities are based on differences between the original plan contours and finished grades as determined by digital terrain modeling software with a grid size of 0.5 meters. Adjustments in quantities will be computed in cubic meters by the average end area method.

1.7.2 Payment

1.7.2.1 Backfill About Structures

No separate payment will be made for backfill about structures. All such costs shall be included in the applicable contract prices for items to which the work applies.

1.7.2.2 Miscellaneous Fill

Payment for Miscellaneous Fill, will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for shaping, grading, and compacting the fill, complete. Payment will not be included for fills outside the fill limits indicated on the drawings or staked in the field, and other fill requirements for which separate payments are provided.

1.7.2.3 Compacted Fill, Channel

Payment for Compacted Fill, Channel, will be made at the applicable contract unit price per cubic meter, which payment shall constitute full

compensation for shaping, grading, and compacting the fill, complete. Payment will not be included for fills outside the fill limits indicated on the drawings or staked in the field, and other fill requirements for which separate payments are provided.

1.7.2.4 Compacted Fill, Pipe

Compacted Fill, Pipe, is based on the quantity of fill over the pipe, after initial bedding and backfilling to a level 610 millimeters above the top of the pipe, and to the finished grades shown on the plans. The initial bedding and backfilling is not included under this item but shall be included in the bid item for pipe. Payment for compacted Fill, Pipe, will be at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for shaping, grading and compacting fill complete. Payment will not be included for fills outside the fill limits indicated on the drawings or staked in the field, and other fill requirements for which separate payments are provided.

1.7.2.5 Compacted Fill, Road

Payment for Compacted Fill, Road, will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for shaping, grading, and compacting the fill, complete. Payment will not be included for fills outside the fill limits indicated on the drawings or staked in the field, and other fill requirements for which separate payments are provided.

1.7.2.6 Trenches

No separate payment will be made for backfilling up to a level of 610 millimeters above the top of pipe. All costs in connection therewith shall be included in the contract prices for items to which the work applies.

1.7.2.7 Subgrade Preparation

No separate payment will be made for subgrade preparation for areas of fill, and all costs in connection therewith shall be included in the contract prices.

1.8 REINFORCED CONCRETE PIPE

1.8.1 Measurement

Provide RCP piping as shown on the drawings. The Work shall consist of a complete installation. All excavation, bedding material, initial backfill material up to a level of 610 millimeters above the top of pipe, compaction of bedding and initial backfill, and all other trenching related work shall be included. Any trench excavation greater than 1.524 meters deep (vertical wall) shall be braced in accordance with Section 02200, 1.4. The pipe shall be measured along the flow line. Laying the pipe to line and grade, grouting in the joints and all other piping installation work shall also be included. All labor, equipment, and materials costs shall be included in the price per meter for each size and class of RCP pipe.

1.8.2 Payment

1.8.2.1 2.438 m Dia. RCP

Payment for reinforced concrete pipe will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for the installation of 2.438 m RCP, involving excavation, bedding and backfill materials and placement, laying the pipe, mortaring the joints, compaction of bedding and backfill materials under, around, and over the pipe to an elevation 610 millimeters above the top of pipe, complete and in place.

1.8.2.2 1.829 m Dia. RCP

Payment for reinforced concrete pipe will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for the installation of 1.829 m RCP, involving excavation, bedding and backfill materials and placement, laying the pipe, mortaring the joints, compaction of bedding and backfill materials under, around, and over the pipe to an elevation 610 millimeters above the top of pipe, complete and in place.

1.8.2.3 1.524 m Dia. RCP

Payment for reinforced concrete pipe will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for the installation of 1.524 m RCP, involving excavation, bedding and backfill materials and placement, laying the pipe, mortaring the joints, compaction of bedding and backfill materials under, around, and over the pipe to an elevation 610 millimeters above the top of pipe, complete and in place.

1.8.2.4 0.457 m Dia. RCP

Payment for reinforced concrete pipe will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for the installation of 0.457 m RCP, involving excavation, bedding and backfill materials and placement, laying the pipe, mortaring the joints, compaction of bedding and backfill materials under, around, and over the pipe to an elevation 610 millimeters above the top of pipe, and plugging playing ends of pipe as shown on the plans complete and in place.

1.9 CAST-IN-PLACE STRUCTURAL CONCRETE

1.9.1 Measurement

The quantity of concrete shall not be measured for payment.

1.9.2 Payment

No separate payment shall be made for concrete. Payment shall be made on a lump sum basis for each structure.

1.10 REINFORCING STEEL

1.10.1 Measurement

The quantity of reinforcing steel shall not be measured for payment.

1.10.2 Payment

No separate payment will be made for steel reinforcement placed in structures for which payment is made on a lump sum basis.

1.11 AGGREGATE BASE COURSE

1.11.1 Measurement

Measurement of aggregate base course will be by the metric ton (1,000 kilograms) of aggregate base course placed within the lines and grades indicated on the drawings.

1.11.2 Payment

Payment for aggregate base course will be made at the applicable contract unit price per metric ton, which payment shall constitute full compensation for work required for installation of aggregate base course, furnishing and placing the aggregate base course, complete, including subgrade preparation.

1.12 TEMPORARY CONSTRUCTION FENCING

1.12.1 Measurement

Measurement for Temporary Construction Fencing will be by the lineal meters of temporary construction fencing installed as indicated on the drawings.

1.12.2 Payment

Payment for Temporary Construction Fencing will be made at the applicable contract price, which payment shall constitute full compensation for temporary chain link fencing complete, including installing posts and chain link fabric, maintaining the fencing during the life of the project, and removing and disposing of the fencing at the completion of the project.

1.13 CHAIN LINK FENCING

1.13.1 Measurement

Measurement of chain link fencing that is provided will be by the linear meters of chain link fencing constructed as shown on the drawings.

1.13.2 Payment

Payment for chain link fencing will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for chain link fencing, including posts with caps, rail, chain link fabric, stretcher bars, tension bands, wire ties, truss wire, sleeves, grout, and all incidentals, complete as shown on the drawings.

1.14 DOUBLE SWING GATE

1.14.1 Measurement

Measurement of double swing gate will be the number of double swing gates acceptably installed.

1.14.2 Payment

Payment for double swing gate will be made at the applicable contract price, which payment shall constitute full compensation for fabricating and installing the double swing gate, complete, including posts with caps, chain link fabric, frame members, tension bands, truss rods, stretcher bars, wire ties, truss wire, sleeves, hinges, grout, and all incidentals, complete, as show on the drawings.

1.15 PIPE SAFETY RAILING

1.15.1 Measurement

Measurement of Pipe Safety Railing that is provided will be by the linear meters of pipe safety railing constructed as shown on the drawings.

1.15.2 Payment

Payment for Pipe Safety Railing will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for Pipe Safety Railing, including pipe railing and posts, sleeves, including sleeves for safety rail, fabrication, grout or dry pack, and all incidentals, complete.

1.16 TRASH RACK

Payment for each trash rack that is provided will be made at the applicable contract price, which payment shall constitute full compensation for the trash rack, complete as shown on the drawings, including all incidentals, complete.

1.17 FILTER MATERIAL FOR RIPRAP CHANNEL

1.17.1 Measurement

Measurement for Filter Material for Riprap Channel will be by the metric ton (1,000 kilograms) of filter material placed to the lines and grades indicated on the drawings.

1.17.2 Payment

Payment for Filter Material for Riprap Channel will be made at the applicable contract unit price per metric ton, which payment shall constitute full compensation for work required for installation of filter material, furnishing and placing the filter material, complete.

1.18 RIPRAP PLACEMENT

1.18.1 Measurement

Measurement for Riprap Placement will be by the metric ton (1,000 kilograms) of riprap placed to the lines and grades indicated on the drawings.

1.18.2 Payment

Payment for Riprap will be made at the applicable contract unit price per metric ton, which payment shall constitute full compensation for work required for installation of riprap, furnishing and placing the riprap, complete.

1.19 MANHOLE, JUNCTION STRUCTURE

Payment for Manhole Junction Structure will be made at the applicable contract price, which payment shall constitute full compensation for the manhole structure, complete, including excavation and backfill about structure; steel reinforcement, furnishing, placing, finishing and curing concrete; installation of manhole cover and frame, grade ring, eccentric cone, risers, steps, grout, and dowels; and all incidentals, as shown on the drawings. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

1.20 PRECAST TEE AND CATCH BASIN

Payment for Precast Tee and Catch Basin will be made at the applicable contract price, which payment shall constitute full compensation for the manhole structure, complete, including excavation and backfill about structure; furnishing, placing, finishing and curing concrete; installation of manhole cover and frame, grade ring, eccentric cone, risers, steps, grout, and dowels; and all incidentals, as shown on the drawings. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

1.21 PRECAST TEE

Payment for Precast Tee will be made at the applicable contract price, which shall constitute full compensation for structure, complete, including excavation and backfill about structure; furnishing, placing, finishing and curing concrete; and all incidentals, as shown on the drawings. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

1.22 1.829 PIPE HEADWALL AND APRON

Payment for 1.829 Pipe Headwall and Apron will be made at the applicable contract price, which payment shall constitute full compensation for the headwall and apron, complete, including excavation and compacted backfill; furnishing and placing reinforcing steel; furnishing, placing, finishing, and curing concrete for footings, cutoffs, walls, slabs, and aprons as shown on the drawings; and all incidentals, except trash rack and pipe

safety rail that are paid separately.

1.23 1.524 PIPE HEADWALL AND APRON

Payment for 1.524 Pipe Headwall and Apron will be made at the applicable contract price, which payment shall constitute full compensation for the headwall and apron, complete, including excavation and compacted backfill; furnishing and placing reinforcing steel; furnishing, placing, finishing, and curing concrete for footings, cutoffs, walls, slabs, and aprons as shown on the drawings; and all incidentals, except trash rack and pipe safety rail that are paid separately.

1.24 STILLING BASIN

Payment for Stilling Basin will be made at the applicable contract price, which payment shall constitute full compensation for the stilling basin, complete, including excavation and compacted backfill; furnishing and placing reinforcing steel; connection to existing concrete, including sawcuts, demolition, and dowels: furnishing, placing, finishing, and curing concrete for, cutoffs, walls, slabs, and sills as shown on the drawings; and all incidentals including all channel related construction upstream of Station 13+81.973, except the removal of grouted riprap that is paid separately under Item 0005.

1.25 SOIL STABILIZER

1.25.1 Measurement

Measurement of the Soil Stabilizer will be by the hectare placed in accordance with the specifications.

1.25.2 Payment

Payment for dust control soil stabilizer will be made at the applicable contract price, which payment shall constitute full compensation for the soil stabilizer, including furnishing the material, loading, hauling, placing and incidentals necessary for doing all the work involved in placing the stabilizer where specified or established by the Contracting Officer.

1.26 LANDSCAPING

Payment for LANDSCAPING will be made at the applicable contract price, which payment shall constitute full compensation for landscaping, complete, including removal and salvage of native plants and topsoil, seeding and watering, and desert varnish coloring.

1.27 WASTE PILE DISPOSAL

Payment for Waste Pile Disposal will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for excavation, loading, and hauling to the scour site.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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SECTION 02200

EXCAVATION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

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

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-01 Data

Excavation Plan; FIO.

The Contractor shall submit his excavation plan to the Contracting Officer in conformance with paragraph GENERAL.

Haul Route Plan; GA.

The Contractor shall submit a haul route plan for removal of required excavated materials and for placing required fill materials.

SD-04 Drawings

Shop Drawings; GA.

The Contractor shall submit for approval shop drawings showing proposed method of bracing which he intends to use to protect existing property.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

Excavation shall consist of the removal of every type of material encountered (except materials covered by the provisions of Section 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS in the designated areas or from areas directed. The material to be removed may include but is not limited to hardpan, silt, sand, gravel, cobbles and boulders, cemented silt/sand/gravel/cobbles/boulders with various degrees of cementations, caliche, asphalt, and other materials. The Contractor shall excavate the basin as shown on the project plans. 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. Measurement for payment shall be made in accordance with Section 01250 MEASUREMENT AND PAYMENT. Excavation for permanent cuts shall be made to the slope lines indicated. Excavation may require ripping or other rock-excavation techniques and shall be performed in a manner which will not impair the subgrade. Except as otherwise specified, the finish surface of subgrades shall be smooth and shall not vary more than 1 inch from indicated grade, except at areas to receive concrete where finished surfaces of subgrade shall not vary more than 0.5 inches from indicated grade. Prior to commencing excavation, the Contractor shall submit his excavation plan to the Contracting Officer. All subgrade excavations will be inspected by the Contracting Officer prior to placement of any fill materials. Rock or cemented material from required excavation to be used in project fills shall be crushed or otherwise reduced in size to meet fill gradation requirements prior to placement or stockpiling. Suitable materials from required excavation to produce soil aggregates for Roller Compacted Concrete shall be crushed and processed to meet required gradations.

3.2 PRESERVATION OF PROPERTY

All excavation operations shall be conducted in such a manner that concrete structures, embankments, utilities 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 piling, cribbing, bulkheads, shores, or whatever means may be necessary to adequately support material carrying such improvements or to support the 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 the property of the Contractor and when no longer needed shall be removed from the site. The Contractor shall submit for approval shop drawings showing proposed method of 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 pressures 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 manner as not to disturb or damage the finished concrete or other facility.

3.3 **3.3 EXCAVATION**

The excavation of the inflow channel and structure, and the roadside channel shall be in accordance with lines and grades as shown on the drawings. The finished surface shall be reasonably smooth, free from irregular surface changes, and shall not vary more than 0.5 inch above or below the indicated grade, except that either extreme of such tolerance shall not be continuous over an area greater than 500 square feet.

The excavation within the detention basin shall be to the lines and grade shown on the drawings. The basin excavation area shall be regular in shape, graded smoothly and graded to drain.

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.

3.4 REMOVAL OF UNSATISFACTORY SOILS

The removal of soils which are unsatisfactory for foundation of the spillway/stilling basin or structures may be required in certain areas. Unsatisfactory materials include but are not limited to those materials containing roots and other organic matter, trash, debris and materials classified in ASTM D 2487, as Pt, OH, OL, CH, MH, and materials that are too wet to support construction equipment. The Contractor will be required to excavate any such areas to the depth directed and backfill the areas with compacted fill conforming to the requirements of the Section 02250 FILLS AND SUBGRADE PREPARATION.

3.5 DISPOSITION AND DISPOSAL OF EXCAVATED MATERIALS

Excavated materials suitable for required fills or Roller Compacted Concrete shall be placed in temporary stockpiles or used directly in the work. Excess suitable excavated material not utilized as part of the construction shall be disposed of at the disposal site. 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 the expressed authority of the Contracting Officer. Prior to placing material in fill areas and any approved stockpile area(s), the areas 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 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS. Any stockpiles shall be placed in a manner to preclude ponding of water.

3.5.1 Hauled Excavation Material

The Contractor shall have a haul route plan for removal of required excavated materials and for placing required fill materials. This haul route plan shall be submitted to the Contracting Officer for approval. The Contractor will be responsible for obtaining all permits and licenses necessary to haul material off-site. The Contractor will provide to the Contracting Officer three copies of the proposed street haul route plan for transport of all excess excavated material.

3.6 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 the Section 02250 FILLS AND SUBGRADE PREPARATION. All excavating, backfilling, and compacting of backfill occasioned thereby shall be by the Contractor at no additional cost to the Government.

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02250

FILLS AND SUBGRADE PREPARATION

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SECTION 02250

FILLS AND SUBGRADE PREPARATION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-1bf/cu. ft. (2,700 kN-m/cu. m.))
ASTM D 2216	(1998) Laboratory Determination of Water (Moisture) Content of Soil and Rock
ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Moisture-density relations; GA.

Moisture-density relations shall be determined by the Contractor, in accordance with the requirements in paragraph LABORATORY CONTROL.

SD-09, Reports

Field Density Tests; FIO.

Field density tests shall be performed by the Contractor. The Contractor shall submit reports as required in paragraph CONTROL.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 COMPACTION EQUIPMENT

Compaction shall be accomplished by tamping roller, rubber tired roller vibratory compactor or mechanical tampers. All equipment, tools, and machines shall be maintained in satisfactory working condition at all times. Compaction equipment shall be suitable for consistently producing uniform soil densities.

3.2 GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS

3.2.1 Control

Moisture-density relations shall be established by the Contractor. The soil used for each maximum density test shall be classified in accordance with ASTM D 2487 and shall include a particle size analysis in accordance with ASTM D 422. At least one five point maximum density test shall be made for every 10 field density tests. Field density tests shall be performed by the Contractor at the frequency established in paragraph: FIELD CONTROL, 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.

3.2.1.1 Laboratory Control

Moisture-density relations shall be established by the Contractor. One moisture-density relation shall be made for each classification, blend or change in classification of soil materials 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.

a. 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.

3.2.1.2 Field Control

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. Determination of in-place densities using the nuclear method ASTM D 2922 may be used to supplement the sand cone density tests ASTM D 1556.

When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. At least one adjacent sand cone test shall be performed for every five nuclear density tests performed. If field density tests determined by the nuclear method vary by more than 3 pounds per cubic foot from comparison sand-cone tests, and are consistently high or low, adjustment of the calibration curve is necessary.

a. In-Place Densities

(1) One test per 1,000 cubic yards, for the first 10,000 cubic yards of material and one test for each 2,000 cubic yards thereafter, or fraction thereof, shall be made of each lift of fill or backfill areas compacted by other than hand-operated machines. At least one test shall be made in each 2.0 foot layer of compacted fill or backfill processed as a unit and not less than one test shall be made in each area.

(2) One test per 500 cubic yardss, or fraction thereof, shall be made of each lift of fill or backfill areas compacted by hand-operated machines.

3.2.1.3 Test Logs

The Contractors CQC shall maintain a log of all tests which will be updated and submitted to the Contracting Officer on a weekly basis. The test log shall include: Test number (if retest, shall include retest number), data, feature of work, station and offset, weight of wet soil, weight of dry soil, percent of compaction, optimum moisture content, maximum dry unit weight, soil classification, in-place density test methods either sand-cone or nuclear densimeter.

3.2.2 Settling of Fills or Backfills with Water

Settling of fills or backfills with water will not be permitted.

3.2.3 Fill Material

Fill material shall be obtained from the basin excavation, foundation excavation or stockpiles. Materials considered unsatisfactory for use as compacted fill include but are not limited to those materials containing roots and other organic matter, trash, debris, oversize chunks or clumps of cemented material. Fill material shall contain no stone whose greatest dimension is more than 3/4 the lift thickness. The contractor shall be expected to break-down, crush, or otherwise process the excavated material for use as fill material due to the cementation of in-situ soil. Materials classified in ASTM D 2487 as MH, CH, Pt, OH, and OL are also considered unsuitable for use as compacted fill. Fill material behind concrete and/or RCC structures shall contain less than 30 percent by weight passing the No. 200 sieve and shall not contain stones larger than 3 inches.

3.2.4 Placement

Heavy equipment shall not be operated over pipes and buried structures

until at least 2.0 feet of fill material has been placed and compacted over them. Material from the top of the pipe or buried structure to 2.0 feet above pipe or buried structure shall be compacted by mechanical tampers or other equipment approved by the Contracting Officer. Compacted fill and backfill shall be placed with suitable equipment in horizontal layers which before compaction, shall not exceed 1.0 foot in depth for rubber-tired or vibratory rollers, 8 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.

3.2.5 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 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 2 percent above optimum and a minimum moisture content of not less than 2 percent below optimum.

3.2.6 Compaction

No layer of fill shall be compacted before the practicable uniform moisture content has been obtained. Scarified areas shall be compacted as specified for the fill placed thereon. Rollers will not be permitted to operate within 1.0 foot of outlet conduit or structure walls or over buried structures until the compacted fill over the top of the structures has reached a depth of 2.0 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.

3.3 COMPACTED FILL

3.3.1 Compacted Fill

3.3.1.1 Preparation for Placing

Before placing material for compaction, the surface shall be cleared of all existing obstructions, vegetation and debris. Material shall be removed in accordance with Section 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS and Section 02200 EXCAVATION. Unsatisfactory material not meeting the requirements for fill material shall be removed where directed. The existing surfaces shall be scarified to a depth of 6 inches and proofrolled by four passes of the compaction equipment before placing the fill. Sloped ground surfaces steeper than one vertical to four horizontal, on which fill or compacted backfill is to be placed, shall be stepped in such a manner that the compaction equipment will bear on the full depth of the layer.

3.3.1.2 Compaction

Each layer of the materials shall be compacted to not less than 95 percent of maximum density, per ASTM D 1557.

3.3.2 Filter Material

3.3.2.1 Preparation for Placing

Foundation for the filter material shall be cleared of all existing obstructions, vegetation and debris. Any trash or debris shall be removed in accordance with Section 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS and Section 02200 EXCAVATION. Unsatisfactory material not meeting the requirements for fill material shall be removed where directed. The existing surfaces shall be scarified to a depth of 6 inches and proofrolled by four passes of the compaction equipment before placing the filter material. The subgrade for Filter Material shall be prepared in accordance with paragraph SUBGRADE PREPARATION.

3.3.2.2 Material

Filter material and gradation shall be in accordance with SECTION 02600 STONE PROTECTION.

3.3.2.3 Placement and Compaction

Filter material shall be spread by motor graders or other approved means in approximately horizontal layers to the lines and grades indicated on the plans, the thickness of the layers before compaction shall not be more than 1.0 foot, the entire surface of the layer shall be compacted by not less than four complete passes of the 9-ton vibratory roller. Each trip of the roller shall overlap the adjacent trip not less than 1.0 foot. The finished surface of the filter material shall not vary more than 0.5 inches above or below the indicated grades.

Filter material shall not be placed under 6 inch diameter riprap, only 18 inch diameter and 12 inch diameter riprap.

3.4 SUBGRADE PREPARATION

Subgrade preparation shall include subgrade preparation for areas to receive aggregate base course paving for access roads, maintenance roads and turnarounds. All trash and debris shall be removed in accordance with Section 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS and Section 02200 EXCAVATION. The entire subgrade for the area indicated above shall be moisture conditioned and proofrolled by 4 passes of the compaction equipment and trimmed to a uniform grade and smoothed with a steel-wheeled roller to make the subgrade ready to receive aggregate base. If the subgrade is disturbed by the Contractor's operations or is overexcavated, or is soft or yielding, the subgrade shall be restored to grade and compacted to a density of 95 percent of maximum density, per ASTM D 1557. The finished surface of the subgrade shall not be more than 0.5 inches from the indicated grade at any point when tested with a 10 foot straightedge.

3.5 **3.5 SOIL STABILIZER**

This work shall consist of application of a dust control soil stabilizer to ground surfaces as directed by the Contracting Officer. The work shall include furnishing and applying the stabilizer to the finished grade surfaces that have been disturbed by construction including all exposed excavation and fill surfaces, and haul roads.

The soil stabilizer shall be a mixture of plaster and natural cellulose fiber mulch. The cellulose fiber mulch shall be produced from grinding clean, whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7 percent. The plaster shall consist of natural occurring high purity processed gypsum and additives. The gypsum shall be produced from a mined or quarried source. The gypsum shall be processed to be composed of a crushed, dry calcium sulfate hemihydrate having a purity of not less than 88 percent. The soil stabilizer shall be mixed with color pigments to match existing soil color on site. Color can be matched by using the "Davis Colors" chart by Soil-Tech, Las Vegas, Nevada or equal. The gypsum and additives shall be furnished either in bags or bulk and be accompanied by bills of lading and shipping invoices. The shipping invoices for the gypsum shall state the gypsum's purity content, dry weight, and source of manufacture. Processed gypsum which has become partially air set, lumpy or caked shall not be used. The plaster/cellulose fiber mulch shall be applied at a rate of 3.0 tons of plaster mixed with 1.0 ton of fiber per acre. The plaster/cellulose fiber mulch stabilizer shall formulate a protective crust-like barrier within 4 to 8 hours after application. Application of the plaster/cellulose fiber mulch stabilizer will not be permitted when weather conditions are unsuitable for concrete placement in accordance with Section 03360 ROLLER-COMPACTED CONCRETE.

3.6 **3.6 DISPOSAL SITE**

3.6.1 **3.6.1 Miscellaneous Fill for Berms**

Miscellaneous fill for use in constructing the berms at the required disposal site shall be obtained from the required excavation including materials from the outlet channel waste pile. Material shall be placed with suitable equipment in layers which shall not exceed 24 inches in depth before consolidation and shall be placed to the lines and grades indicated on the drawings. Broken concrete, rock, caliche, and cemented alluvium to be wasted may be buried in the required disposal areas, provided such material does not exceed 24 inches in its greatest dimension, is placed in a manner that will prevent the formation of voids, and is placed not less than 24 inches below finished grade. Compaction other than that obtained by the controlled movement of the construction equipment will not be required.

3.6.2 **3.6.2 Facing Material for Berms**

Facing material for berms at the required disposal site, shall be obtained from the required excavation including materials from the outlet channel waste pile. Materials considered satisfactory for use as facing material shall be those materials containing stones no larger than 1 inch. Facing material shall be placed with suitable equipment in layers to the lines and

grades indicated on the drawings. Compaction other than that obtained by the controlled movement of the construction equipment will not be required.

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SECTION 02600

STONE PROTECTION

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SECTION 02600

STONE PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

American Society for Testing and Materials (ASTM)

ASTM C 33	(1999a) Concrete Aggregates
ASTM C 88	(1999a) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 127	(1988; R 1993) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 295	(1998) Petrographic Examination of Aggregates for Concrete
ASTM C 535	(1996) Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM D 1141	(1980) Substitute Ocean Water
ASTM D 5519	(1994) Particle Size Analysis of Natural and Man-Made Riprap Materials
ASTM E 548	(1994) General Criteria Used for Evaluating Laboratory Competence

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Placing Method and Equipment; GA.

All placing methods and equipment shall be submitted for review by the Contracting Officer for conformance with paragraph PLACEMENT.

SD-09 Reports

Gradation Sampling and Testing; GA.

Copies of field test results within 24 hours after the tests are performed. Certified copies of test results shall be submitted for approval in accordance to paragraph GRADATION SAMPLING AND TESTING.

SD-14 Samples

Stone Quality; GA.

Stone quality samples shall be submitted at least 45 days prior to start of stone placement, in accordance with paragraph STONE QUALITY.

SD-18 Records

Waybills and Delivery Tickets; FIO.

Copies of waybills and delivery tickets during the progress of the work. Certified waybills and delivery tickets for all materials actually used as required in paragraph WAYBILLS AND DELIVERY TICKETS.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Definitions

2.1.1.1 Rounded Stone

Stone which is obtained from alluvial deposits and is nearly spherical and well rounded.

2.1.1.2 Angular Stone

Stone which is obtained from bedrock deposits and is angular in shape.

2.1.2 General

The Contractor shall make all arrangements, pay all royalties, and secure all permits for the procurement, furnishing and transporting of stone. The Contractor shall vary the quarrying, processing, loading and placing operations to produce the sizes and quality of stone 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.

2.1.3 Stone Sources

2.1.3.1 Stone From Project Excavation

Stone conforming to these specifications may not be available from the required excavation in sufficient quantities of suitably large stone.

Therefore, additional required stone may need to be obtained from offsite sources. One offsite source is Sloan Quarry located about 16 miles to the southeast of the project site.

2.1.3.2 Source Authorization

Before any stone is produced from a source for completion of the work under this contract, the source of stone must be authorized by the Contracting Officer's Representative. Authorization of a stone 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 materials do not comply with the specifications.

2.1.3.3 Source Development

Before a proposed source or sources of stone will be considered for sampling and testing, the Contractor must demonstrate that the source has sufficient stone to fulfill the contract requirements. If sufficient amounts of stone conforming to these specifications are not available from a source or sources used in the work, the Contractor shall submit stone from another source for authorization.

2.1.3.4 Source Documentation

Authorization of a proposed stone source will be based on test results and/or service records. In general, current Corps of Engineers test results shall be required as outlined in paragraph: Quality Compliance Testing, below. In special cases, however, the Contracting Officer's Representative may elect to use either past Corps of Engineers test results, test results from other agencies or private laboratories, or service records. A service record is considered to be acceptable if stone from the proposed source has remained sound and functional after at least 10 years of exposure on a project similar to the one to be constructed under these specifications.

2.1.4 Stone Quality

2.1.4.1 Quality Compliance Testing

Samples for Corps of Engineers testing as specified in paragraph: Source Documentation shall be submitted a minimum of 45 days in advance of the time when the stone will be required in the work. Stone from a proposed source will be tested by the Government for quality compliance. The first test shall be at Government expense, however, if the stone fails the tests, or if the Contractor desires to utilize more than one source, additional testing will be performed by the Government at the Contractor's expense. The cost of additional testing will be deducted from payment due the Contractor in the amount of $4,500 for each sample tested. All test samples (300 lb) shall be representative of the stone source and shall be obtained by the Contractor under the supervision of the Contracting Officer's Representative and delivered at the Contractor's expense to a testing laboratory specified by the Contracting Officer's Representative. The testing laboratory suggested by the Contractor and specified by the

Contracting Officer's Representative shall be under the supervision of a licensed Civil or Geotechnical Engineer or a licensed/registered Geologist.

2.1.4.2 Stone Quality Testing Requirements

Stone shall be subjected to such tests as are necessary to demonstrate to the satisfaction of the Contracting Officer's Representative that the materials are acceptable for use in the work. At a minimum the stone shall meet the following test requirements.

Test	Test Method	Requirement
Specific Gravity (Bulk SSD)	ASTM C 127	2.60 minimum
Absorption	ASTM C 127	2.0% maximum
Wetting and Drying	SPD Test Procedure(1)	No fracturing(3)
Sulfate Soundness	ASTM C 88(2)	10% max.loss(4)
Abrasion Loss	ASTM C 535	50% max.loss(4)

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(5). The stone must not contain any expansive clays. Stone for grouted stone protection shall not contain excessive amounts of deleterious minerals associated with alkali-silica or alkali-carbonate reactions as described in ASTM C 33.

NOTE: (1): Test procedure for wetting and drying test. The entire sample is carefully examined and representative test specimens are selected. The sample should be large enough to produce two cut slabs, 1 inch thick (+/- 1/4 in) with a minimum surface area of 30 square inches on one side. Two chunks approximately 3 by 4 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 actions 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 particles broken 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 ASTM C 88.

NOTE: (3): Weakening and loss of individual surface particles is

permissible unless bonding of the surface grains softens and causes general disintegration of the surface material.

NOTE: (4): Stone which has a loss greater than the specified limit will be accepted if the Contractor demonstrates that the stone has a satisfactory service record.

NOTE: (5): The test procedure for Petrographic and X-ray Diffraction is performed according to ASTM C 295, except for the following:

(a) A color, microscopic photograph shall be made of each stone type and the individual minerals within the stone shall be identified by labels and arrows upon the photograph.

(b) A very detailed macroscopic and microscopic description shall be made of the stone, to include the entire mineral constituents, individual sizes, their approximate percentages and mineralogical histories. A description of stone hardness, texture, weathering, and durability factors shall also be discussed.

(c) A written summary of the suitability of stone for use as riprap based on the Petrographic and X-ray tests and the results of ASTM C 535 shall be presented in the final laboratory report on stone quality.

2.1.4.3 Stone Acceptance Criteria

Prior to placement, all stone shall be subject to acceptance by the Contracting Officer's Representative. Acceptance of any stone shall not constitute acceptance of all stone from a source. All accepted stone shall be:

a. of the same lithology as the original stone from which test results or service records were taken as a basis for authorization of the source;

b. sound, durable and hard, and free from laminations, weak cleavages, undesirable weathering, or blasting or handling-induced fractures (or fracture zones which subtend more than 1/3 of the total circumference of the stone along the plane of fracturing);

c. of such character that it will not disintegrate from the action of air, water, or the conditions of handling and placing; and,

d. clean and free from earth, clay, refuse, or adherent coatings.

In addition, to be accepted, the greatest dimension of any stone piece shall not be greater than 3 times its least dimension.

2.1.4.4 Stone for Riprap

Stone for riprap protection shall be angular quarried material.

2.1.5 Gradation

2.1.5.1 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 requirement are met. All gradation tests shall be at the expense of the Contractor. For the size-weight relationships used during gradation tests, within-specification weights will be determined based on a stone specific gravity of 2.58 and stone sizes (diameters) that result for stone shapes midway between that of a sphere and a cube.

2.1.5.2 Stone Riprap

Stone Riprap shall be reasonably well-graded within the limits specified below, when tested in accordance with ASTM D 5519, Test Method A.

D_{50} = 6" Stone Riprap,

	Min (in)	Max (in)
D_{100}	6.7	9.0
D_{50}	5.2	6.0
D_{15}	3.4	4.6
D_{90} (min)	6.5	
D_{30} (min)	4.4	
Thickness, (min)	9.0	

D_{50} = 12² Stone Riprap,

	Min (in)	Max (in)
D_{100}	13.3	18.0
D_{50}	10.5	12.0
D_{15}	7.1	9.5
D_{90} (min)	12.7	
D_{30} (min)	8.8	
Thickness, (min)	18.0	

D_{50} = 18² Stone Riprap

	Min (in)	Max (in)
D_{100}	19.9	27.0
D_{50}	15.8	18.0
D_{15}	10.7	14.3
D_{90} (min)	19.1	

D_{30} (min)	13.2
Thickness, (min)	27.0

2.1.5.3 Gradation Sampling and Testing

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Tests shall be performed by an approved testing laboratory on samples selected by the Contracting Officer's Representative. Testing may be done by the Contractor, subject to approval by the Contracting Officer's Representative. If the Contractor elects to establish testing facilities, approval of such facilities shall be based on compliance with ASTM E 548, and no work requiring testing will be permitted, until the Contractor's facilities have been inspected and approved by the Contracting Officer's Representative. Testing shall be supervised by a registered Civil Engineer, experienced in rock-testing. The Government reserves the right to perform check tests and to use the Contractor's sampling and testing facilities to make the tests. One gradation test each shall be required for the 18" riprap, the 12" riprap, and the 6" riprap at the beginning of production prior to delivery of stone from the source to the project site. A minimum of one additional test each for the 18" riprap, the 12" riprap, and the 6" riprap shall be required for each 5,000 tons of stone placed, respectively. All sampling and gradation tests performed by the Contractor shall be under the supervision of the Contracting Officer's Representative. Each sample shall consist of not less than 5.0 tons of stone, selected at random from the production run for the first test or from stone placed on grade or stockpiled on-site for required additional tests

2.1.6 Rejected Stone

Stone of unsuitable quality and/or size distribution as required by these specifications shall be rejected. Any rejected stone shall be promptly removed from the project at no expense to the Government. Any portions of the work covered by these specifications containing rejected stone will be considered incomplete.

2.1.7 Filter Material

2.1.7.1 Material

Filter material shall be processed from materials obtained from the required excavations or may be obtained from commercial sources. Filter material shall consist of natural sand, manufactured sand, or a combination of natural and manufactured sands.

2.1.7.2 Gradation

Filter material shall be reasonably well graded within the following limits:

Sieve Size	Percent by Weight Passing
3/8"	100
No. 4	85-95
No. 16	35-45
No. 100	0-20

No. 200 0-15

2.1.8 Disposal Site Riprap for Berms

Stone riprap for berms at the disposal site shall be angular quarried material and shall use 18-inch size stone riprap. Gradation of stones shall be in accordance with paragraph 2.1.5.2.

PART 3 EXECUTION

3.1 FOUNDATION PREPARATION

3.1.1 General

Subgrade preparation for material placement shall conform to the provisions of SECTION 02250 FILLS AND SUBGRADE PREPARATION. Areas on which stone is to be placed shall be trimmed and dressed to conform to cross sections indicated or directed, within an allowable tolerance of plus or minus 1" from the theoretical slope lines and grades. Where such areas are below the allowable minus tolerance limit, they shall be brought to grade by filling with earth similar to the adjacent material and well compacted, or by filling with approved material, and no additional payment will be made for any material thus required. Immediately prior to placing the stone, the prepared base shall be inspected by the Contracting Officer's Representative and no material shall be placed thereon until that area has been approved.

3.2 PLACEMENT

3.2.1 General

Except as otherwise specified, the limits of stone in place shall follow, with reasonable variation, the indicated lines and slopes, without continuous under- or overbuilding. Templates shall be placed at adequate intervals, as determined by the Contracting Officer's Representative, to accurately delineate the surface of the work being placed. For all stonework, the Contractor shall submit the method of placement to the Contracting Officer's Representative for approval, before placement begins.

3.2.2 Stone Riprap

Stone Riprap shall be placed in a manner to produce a reasonably well-graded mass with the minimum practicable percentage of voids, and shall be constructed to the lines and grades indicated or directed. Stone shall be placed to its full course thickness in one operation and in a manner to avoid displacing the underlying material. Material shall not be dropped from a height of more than 18". The placing method shall be submitted to Contracting Officer's Representative for approval prior to commencement of placement operations. The Contractor shall maintain the stone protection until accepted and any material displaced by any cause shall be replaced at the Contractor's expense to the lines and grades shown on the drawings. Self propelled equipment shall not be used on the slopes. Hand placing, barring, or placing by crane will be required only to the

extent necessary to secure the results specified. Placing stone by dumping into chutes or by similar methods likely to cause segregation will not permitted. A tolerance of minus 1" to plus 2" from the indicated slope lines and grades will be allowed in the finished surface, except that either extreme of such tolerance shall not be continuous over an area greater than 25 square yards.

3.3 DELIVERY

All stone delivered by rail or truck shall be weighed and the scale tickets certified by authorized weighers. All railroad cars and trucks used for delivering stone shall be plainly numbered.

3.3.1 Scales

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 the 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. The scales shall be of sufficient size and capacity to accommodate all trucks used in hauling the material. Scales shall be tested, approved, and sealed by an inspector of the State Inspection Bureau charged with scales inspection within the state in which the project is located. Scales shall be calibrated and resealed as often as the Contracting Officer's Representative considers necessary to insure continuous accuracy. The necessary number of standard weights for testing the scales shall be on hand at all times and, if an official inspection bureau of the state is not available, the scales will be tested by the Contracting Officer's Representative.

3.3.2 Waybills and Delivery Tickets

Copies of waybills or delivery tickets shall be submitted to the Contracting Officer's Representative during the progress of the work. The Contractor shall furnish the Contracting Officer's 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 the loading. Tickets shall be furnished at the point and time individual loads arrive at the work site. A master log of all vehicle loading shall be furnished for each day of loading operation. The Contractor shall file with the Contracting Officer's Representative the master log of loadings, certified waybills and/or certified tickets within 24 hours of material delivery. Prior to the final payment, the Contractor shall furnish written certification that the material recorded on the submitted waybills and/or certified tickets was actually used in the construction covered by the contract.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

TEMPORARY TORTOISE FENCING

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SECTION 02832

TEMPORARY TORTOISE FENCING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 702	(1989; R 1994) Steel Fence Posts and Assemblies, Hot Wrought
ASTM A 740	(1986) Hardware Cloth (Woven or Welded Galvanized Steel Wire Fabric)
ASTM A 824	(1995) Metallic- coated Steel Marcelled Tension Wire for uses with Chain link fence
ASTM C 94/C 94M	(2000) Ready-Mixed Concrete
ASTM F 626	(1996a) Fence Fittings
ASTM F 900	(1994) Industrial and Commercial Swing Gates
ASTM F 1043	(1999) Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework
ASTM F 1083	(1997) Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Steel mesh hardware cloth, post, and accessories; GA.

Submit descriptions and product data on steel mesh hardware cloth, post, accessories, fittings, and hardware.

SD-04 Drawings

Tortoise fencing and layout; GA.

Submit shop drawings showing details of tortoise fencing and gate layout, post foundation dimensions, bracing, hardware, and schedule of components for fence and gates.

SD-14 Samples

Steel mesh hardware cloth; GA.

Submit two samples of steel mesh hardware cloth 6.0 in x 6.0 in in size.

PART 2 PRODUCTS

2.1 MATERIALS

Materials shall conform to the following requirements.

2.1.1 Steel Mesh Hardware Cloth

Steel mesh hardware cloth shall be 0.5 inches mesh, galvanized steel and fabricated in accordance with ASTM A 740.

2.1.2 Line Posts

Line Posts for temporary tortoise fence shall be T-post fabricated in accordance with ASTM A 702.

2.1.3 Tension Wire

Tension wire shall be 11-gauge galvanized steel wire fabricated in accordance with ASTM A 824.

2.2 GATES

ASTM F 900. Gate shall be the type and swing shown. Gate frames shall conform to strength and coating requirements of ASTM F 1083 for Group IA, steel pipe, with external coating Type A, nominal pipe size (NPS) 2 inches. Gate frames shall conform to strength and coating requirements of ASTM F 1043, for Group IC, steel pipe with external coating Type A or Type B, nominal pipe size (NPS) 2 inches. Gate fabric shall be as specified for chain link fabric. Gate leaves shall have either intermediate members and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist. Gate fabric shall be attached to the gate frame by method standard with the manufacturer except that welding will not be permitted. Latches, hinges, stops, keepers, rollers, and other hardware items shall be furnished as required for the operation of the gate. Latches shall be arranged for padlocking so that the padlock will be accessible from both sides of the gate. Stops shall be provided for holding the gates in the open position. The steel mesh hardware cloth shall be attached to the gate frame as shown on the drawings. Latches, hinges, stops, keepers, rollers, and other hardware items shall be furnished as required for operation of the gate.

2.3 ACCESSORIES

ASTM F 626, ferrous accessories shall be zinc or aluminum coated. Truss rods shall be furnished for each terminal post. Tension rods shall be provided with turnbuckles or other equivalent provisions for adjustment.

2.4 CONCRETE

ASTM C 94/C 94M, using 0.75 inches maximum-size aggregate, and having minimum compressive strength of 2,000 psi at 28 days. Grout shall consist of one part portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

PART 3 EXECUTION

3.1 GENERAL

The temporary tortoise Fencing shall be installed after the Biologist survey of the construction site in accordance with Section 01200 ENVIRONMENTAL PROTECTION and prior to initial clearing, grubbing, trash removal, grading or other construction activities in accordance with Section 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS. Temporary tortoise fencing shall be provided along both sides of the haul route from the work area to the disposal site. The Contractor shall maintain the fencing in good condition during the construction period and shall remove the fencing after completion of all construction activities. Install fencing in accordance with manufacturer's instructions and details shown. Fencing shall be adequately braced to support normal usage. Temporary tortoise fencing shall be installed or as directed by the Contracting Officer. If required, ground surface irregularities shall be graded to maintain the top and bottom of the steel mesh fabric within a 2 inches tolerance of the dimensions shown on the drawings. Tortoise proof gates shall be installed across haul roads where the haul roads cross the project right-of-way line and cross the disposal site property. Unless indicated otherwise on the drawings, all temporary tortoise fencing shall be of the same type and design. The temporary tortoise fencing shall be in place before construction and movement of heavy equipment is started and shall remain in place and maintained until all construction work is complete. Temporary tortoise fencing shall become the property of the contractor and shall be removed by the contractor upon completion of the project.

3.2 POSTS

Posts shall be set plumb and in alignment. Except where solid rock is encountered, line posts shall be installed a minimum of 36 inches below existing ground level at a maximum 10.0 feet center to center spacing. Gate posts shall be set in concrete to depth of 36 inches. Where solid rock is encountered with no overburden, posts shall be set to a minimum depth of 18 inches in rock. Where solid rock is covered with an overburden of soil or loose rock, posts shall be set to a minimum depth of 36 inches unless a penetration of 18 inches in solid rock is achieved before reaching the 36 inches depth in which case depth of penetration shall terminate. All portions of posts set in rock shall be grouted. Portions of posts not

set in rock shall be set in concrete from the rock to ground level. Line posts set in concrete shall be set in holes not less than 6 inches in diameter and gate post set in concrete shall be set in holes 12 inches in diameter.

3.3 TENSION WIRES

Stretch tension wire approximately 16 inches above ground and attach securely to line post and gate post as applicable. Tension wire shall be pulled taut and shall be free of sag.

3.4 STEEL MESH HARDWARE CLOTH

Installation of steel mesh hardware cloth shall be in accordance with one of the following options:

Option 1: Bottom of steel mesh hardware cloth shall be buried at least 12 inches below existing ground level.

Option 2: Bend steel mesh hardware cloth at ground level and extend bottom edge at least 18 inches towards the habitat side of fence. Cover flattened steel mesh hardware cloth with cobbles 6 inches in depth.

Steel mesh hardware cloth shall be installed on the habitat side of the post (side away from project area) with the top of the hardware cloth approximately 18 inches above the ground surface. The steel mesh hardware cloth shall be securely attached to the tension wire, with hog ties spaced at 12 inches and to the fence post with 11 gauge tie wires. The steel mesh hardware cloth shall be pulled taut to provide a smooth uniform appearance free from sag.

3.5 GATES

Gates shall be installed at haul road or access road crossings of the indicated temporary tortoise fencing locations. Hinged gates shall be mounted to swing as indicated. Latches, stops, and keepers shall be installed as required.

3.6 MAINTENANCE AND REPAIR

The Contractor shall maintain the temporary tortoise fencing in good condition during construction and shall promptly make repairs to any damaged sections that occur. The temporary tortoise fencing shall be removed after the completion of construction.

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DIVISION 03 - CONCRETE

SECTION 03360

ROLLER-COMPACTED CONCRETE (RCC)

-- End of Section Table of Contents --

SECTION 03360

ROLLER-COMPACTED CONCRETE (RCC)

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 305R	(1991) Hot Weather Concreting
ACI 347R	(1994) Guide to Formwork for Concrete

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(191; R 1996) Burlap Cloth Made form Jute or Kenaf

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 33	(1999a) Concrete Aggregates
ASTM C 117	(1995) Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	(1996a) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 150	(1999a) Portland Cement
ASTM C 171	(1997a) Sheet Materials for Curing Concrete
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 566	(1997) Total Moisture Content of Aggregate by Drying
ASTM C 618	(1998a) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete

ASTM C 1040	(1993; R 2000) Density of Unhardened and Hardened Concrete in Place by Nuclear Methods
ASTM C 1064	(1986; R 1993) Temperature of Freshly Mixed Portland Cement Concrete
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))
ASTM D 3017	(1998; R 1996) Water Content of Soil and Rock in Place By Nuclear Method (Shallow Depth)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4791	(1999) Flat or Elongated Particles in Coarse Aggregate
ASTM E 329	**(1993b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction**

CORPS OF ENGINEERS (COE)

COE CRD-C 53	(1996) Consistency of No-Slump Concrete Using the Modified Vebe Apparatus
COE CRD-C 55	(1992) Within-Batch Uniformity of Freshly Mixed Concrete
COE CRD-C 100	(1975) Method of Sampling Concrete Aggregate and Aggregate Sources, and Selection of Material for Testing
COE CRD-C 143	**(1962) Specifications for Meters for Automatic Indication of Moisture in Fine Aggregate**
COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST HB 44	(1997) NIST Handbook 44: Specifications, Tolerances, and other Technical Requirements for Weighing and Measuring Devices

NATIONAL READY-MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA CPMB 100 (1996) Concrete Plant Standards

1.2 PRECONSTRUCTION TESTING AND MIXTURE-PROPORTIONING STUDIES

1.2.1 RCC Aggregate Sampling and Testing

Materials to be used for production of aggregates may be obtained from on-site or off-site sources. The CONTRACTOR is responsible for selecting the source of materials such that all specified physical properties are met by the selected source(s).

Samples from any source selected, whether off-site or on-site, consisting of not less than 300 pounds of aggregate, and taken under the supervision of the Contracting Officer in accordance with COE CRD-C 100, shall be delivered to a local materials testing laboratory selected by the Government within 45 days after Notice to Proceed. Sampling, shipment, and testing of samples shall be at the Contractor's expense. At least 10 days will be required to complete evaluation of the aggregates. All quality assurance testing will be performed by the Government in accordance with the applicable COE CRD-C or ASTM test methods. Tests to which aggregate may be subjected are: specific gravity, absorption, soft particles, and other tests necessary to demonstrate that the aggregate is of good quality and meeting all specified physical properties. Quality assurance testing of aggregates by the Government does not relieve the Contractor of quality control requirements.

1.2.2 **1.2.2 Cementitious Materials**

At least 60 days in advance of submitting samples for mixture proportioning studies, the Contractor shall notify the Contracting Officer of the source, brand name, type, and quantity of all materials (other than aggregates) to be used in the manufacture and curing of the concrete. Sampling and testing as determined appropriate will be performed by and at the expense of the Government. The Contractor shall assist the Contracting Officer in obtaining samples of each material. Samples of representative materials will be delivered to the address listed in paragraph 1.2.3 at the Contractor's expense. If cement or fly ash is to be obtained from more than one source, the notification shall state the estimated amount of cement or fly ash to be obtained from each source and the proposed schedule of shipments.

1.2.3 Materials for RCC Mixture-Proportioning Studies

At least 60 days in advance of the time when placing of concrete is expected to begin, samples of representative materials proposed for this project and meeting all the requirements of this specification shall be delivered to the laboratory listed below by the Contractor at his expense.

US Army Engineer Waterways Experiment Station
Structures Laboratory, Concrete Division
3909 Halls Ferry Road
Vicksburg, MS 39180

Samples of aggregates shall be taken under the supervision of the Contracting Officer in accordance with COE CRD-C 100, accompanied by test reports indicating conformance with grading and quality requirements specified. Samples of materials other than aggregates shall be representative of those proposed for the project and shall be submitted accompanied by manufacturer's test reports indicating compliance with applicable specified requirements. Quantities of materials required shall be as follows:

MATERIAL	QUANTITY
Aggregate	**5,000 lbs**
Cement	**1,000 lbs**
Pozzolan	**600 lbs**
Washed Concrete Sand	**800 lbs**

Mixture-proportioning studies will be made by the Government at its expense.

1.3 TESTING DURING CONSTRUCTION BY THE GOVERNMENT

1.3.1 **1.3.1 General**

The Government will sample and test cementitious materials, aggregates, and concrete during construction as considered appropriate to determine compliance with the specifications. The Contractor shall provide equipment and labor as may be necessary for procurement of representative test samples. Samples of aggregates will be obtained at the point of batching in accordance with COE CRD-C 100. Consistency of the RCC will be determined by the Government using the modified Vebe apparatus in accordance with paragraph CONSISTENCY OF RCC. Compression test specimens of batch RCC mixture will be made and tested by the Government. Density of the compacted RCC will be checked by the Government as considered appropriate.

1.3.2 Aggregates Sampling and Testing

Testing performed by the Government will not relieve the Contractor of his responsibility for testing under paragraph CONTRACTOR QUALITY CONTROL. During construction, aggregates will be sampled for acceptance testing as delivered to the mixer to determine compliance with specification provisions. The Contractor shall provide necessary facilities and labor for the ready procurement of representative samples under Government supervision. The Government will test such samples at its expense using the specified COE CRD-C and ASTM methods.

1.3.3 **1.3.3 Cementitious Materials**

Cement or pozzolan will be sampled at the mill, shipping point, or site of the work by the Government. Sampling and testing, as determined appropriate will be performed by and at the expense of the Government. If tests prove that a material which has been delivered is unsatisfactory, it shall be promptly removed from the site of the work. Cementitious

materials that have not been used within 6 months after being tested will be retested by the Government at the expense of the Contractor when directed by the Contracting Officer. Samples of representative materials shall be delivered to the laboratory listed in paragraph 1.2.3 by the Contractor at his expense.

1.3.4 **1.3.4 Cement Sources**

Samples of cement will be taken at the project site or cement-producing plant by the Contracting Officer for testing at the expense of the Government. A copy of the mill tests from the cement manufacturer shall be furnished for each lot. No cement shall be used until notice has been given by the Contracting Officer that test results are satisfactory. In the event of failure, the cement may be resampled and tested at the request of the Contractor and at the Contractor's expense. The fill gate or gates of the sampled bin will be sealed and kept sealed until shipment from the bin has been completed. Sealing of the fill gate or gates and of conveyances used in shipment will be done by or under the supervision of the Government. Conveyances will not be accepted at the site of the work unless received with all seals intact. If tested cement is rehandled at transfer points, the extra cost of inspection will be at the Contractor's expense. The cost of testing cement will be at the Contractor's expense and will be deducted from payments due the Contractor at a rate of $1,750 per test.

1.3.5 **1.3.5 Pozzolan Sources**

Samples of pozzolan will be taken at the project site by the Contracting Officer for testing at the expense of the Government. A copy of the test results from the pozzolan manufacturer shall be furnished for each lot. All sampling and testing will be performed by and at the expense of the Government. Release for shipment and approval for use will be based on compliance with 7-day lime-pozzolan strength requirements and other physical, chemical, and uniformity requirements for which tests can be completed by the time the 7-day lime-pozzolan strength test is completed. Release for shipment and approval for use on this basis will be contingent on continuing compliance with the other requirements of the specifications. If test results of a bin fail, the contents may be resampled and tested at the Contractor's expense. The Government will supervise or perform the unsealing and resealing of bins and shipping conveyances. If tested pozzolan is rehandled at transfer points, the extra cost of inspection will be at the Contractor's expense. The cost of testing pozzolan will be at the Contractor's expense at a rate of $1,650 per test. The amount will be deducted from payment to the Contractor.

1.3.6 **1.3.6 Deleted**

1.3.7 **1.3.7 Deleted**

1.4 CONSTRUCTION TOLERANCES

1.4.1 General

Tolerances shall be as below:

a. The thickness of compacted lifts of RCC shall be within plus or minus 1 inch of that specified.

b. The allowable variation of the elevation of finished surfaces of RCC lifts upon which subsequent RCC lifts are placed shall be minus zero (0) and plus 1 inch (in any direction), from the design elevation.

1.5 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Batch Plant; GA.

Details and data on the concrete plant shall be submitted prior to plant assembly for review by the Contracting Officer for conformance with the requirements of paragraph BATCH PLANT. Final acceptance of any piece of plant is subject to satisfactory performance during operations.

Mixers; **GA**.

Details and data on the mixing plant including manufacturer's literature on the cementitious material and aggregate feed equipment, water controls, pug mill mixers (plant type and capacity), and layout plan showing that the equipment meets all specified requirements, shall be submitted 30 days prior to plant assembly for review and approval by the Contracting Officer for conformance with the requirements of paragraph MIXERS.

Transporting and Conveying Equipment; FIO. Spreading and Remixing Equipment ; FIO. Compaction Equipment; GA.

A listing of the equipment proposed for transporting, handling, depositing, spreading, and compacting the concrete shall be submitted for review by the Contracting Officer before concrete placement begins. The data submitted shall include site drawings or sketches with locations of equipment and placement site.

Nuclear Density Gauge; **FIO**.

A description of the nuclear density gauge apparatus proposed for use including manufacturer's literature and the latest manufacturer's calibration results of the nuclear density gauge shall be submitted for review by the Contracting Officer 30 days prior to use.

SD-08 Statements

Aggregate and Concrete Production; GA.

Descriptions and details for all methods and operations proposed for

aggregate and concrete operations including daily and weekly production rates, shall be submitted for review and approval for conformance with specifications.

Joint Cleanup and Waste Disposal; FIO.

The method and equipment proposed for joint cleanup and waste disposal shall be submitted for review by the Contracting Officer before concrete placement begins for conformance with paragraph JOINTS.

Curing; GA.

The curing media and methods to be used shall be submitted for review to the Contracting Officer before concrete placement begins for conformance with paragraph CURING AND PROTECTION.

Vertical Facings; FIO.

Details of the Contractors construction methods and equipment shall be submitted for review within 60 days after Notice to Proceed.

SD-13 Certificates

Nuclear Density Gauge Operators; GA.

Copies of permits and licenses for gauge operation; copies of certification of training for all operators shall be submitted for review and approval by the Contracting Officer.

Cementitious Materials; GA.

Cementitious materials including cement and pozzolan, will be accepted on the basis of the manufacturer's certification of compliance, accompanied by mill test reports that materials meet the requirements of the specification under which they are furnished. No cementitious materials shall be used until notice of acceptance has been given by the Contracting Officer.

SD-18 Records

Waybills and Delivery Tickets; GA.

Copies of waybills or delivery tickets for cementitious material during the progress of the work shall be submitted for review and approval. Before the final payment is allowed, waybills and certified delivery tickets shall be furnished for all cementitious material used in the construction.

1.6 MATERIAL DELIVERY, STORAGE, AND HANDLING

1.6.1 Cementitious Materials

1.6.1.1 Transportation

When bulk cement or pozzolan is not unloaded from primary carriers directly into weather-tight hoppers at the batching plant, transportation from the

railhead, mill, or intermediate storage to the batching plant shall be accomplished in adequately designed weather-tight trucks, conveyors, or other means that will protect the material from exposure to moisture.

1.6.1.2 Storage

Cementitious materials shall be furnished in bulk. Immediately upon receipt at the site of the work, all cementitious materials shall be stored in a dry, weather-tight, and properly ventilated structure. All storage facilities shall permit easy access for inspection and identification. Sufficient materials shall be in storage for at least two operating days to sustain continuous operation of the mixing plant while the RCC is being placed. In order that cement may not become unduly aged after delivery, the Contractor shall use any cement that has been stored at the site for 60 days or more before using cement of lesser age.

1.6.2 Aggregate Storage

Fine aggregate and each size of coarse aggregate shall be stored in separate size groups, in free-draining stockpiles, adjacent to the batch plant and in such a manner as to prevent the intermingling of size groups or the inclusion of foreign materials in the aggregate. Aggregate shall remain in free-draining storage for at least 24 hours immediately prior to use. Sufficient fine and coarse aggregate shall be maintained at the site at all times to permit continuous uninterrupted RCC placement.

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS

2.1.1 Portland Cement

Portland cement shall conform to ASTM C 150, Type V, low alkali.

2.1.2 Pozzolan

Pozzolan shall conform to ASTM C 618, Class F, with loss on ignition limited to 6 percent.

2.1.3 Temperature of Cementitious Materials

The temperature of the cementitious materials as delivered to the site shall not exceed 150 degrees F.

2.2 CURING MATERIALS

Burlap shall conform to AASHTO M 182

2.3 WATER

Water for washing aggregates and for mixing and curing concrete shall be free from injurious amounts of oil, acid, salt, alkali, organic matter, or other deleterious substances and shall comply with COE CRD-C 400.

2.4 AGGREGATES

2.4.1 Source of Materials

Borrow materials for production of RCC aggregates may be obtained from the required excavation or from off-site sources. The contractor shall make all arrangements, and secure all necessary permits for the procurement, furnishing and transporting aggregates from off-site sources.

2.4.2 Particle Shape

The shape of the particles of the fine aggregate and of the coarse aggregate shall be generally spherical or cubical. The quantity of flat and elongated particles at a length-to-width or width-to-thickness ratio greater than 3 in the separated size groups of coarse aggregate, as defined and determined by ASTM D 4791, shall not exceed 25 percent in any size group.

2.4.3 Deleterious Substances

The maximum plasticity index for RCC aggregate materials shall be limited to 3 when determined in accordance with ASTM D 4318.

2.4.4 Resistance to Abrasion

Coarse aggregate, used in production of RCC, shall not show more than 45 percent loss after 500 revolutions when tested in accordance with ASTM C 131.

2.4.5 Fractured Faces

Coarse aggregate, used in production of RCC, will have a minimum 50 percent fractured faces when tested in accordance with State of Nevada, Department of Transportation (NDOT), Materials Testing Division, T230C (Rev C), "Method of Test for Determining the Percent of Fractured Faces."

2.4.6 Aggregate Gradation

Aggregate samples will be prepared for RCC mix design studies. The Government will use the specified gradations for use in preparation of mixture proportioning studies.

2.4.6.1 RCC Gradation

The aggregate base to be used for RCC construction, when tested in accordance with ASTM C 117 and ASTM C 136, shall conform to the gradation indicated below:

Standard Sieve Size	Percent Passing by Weight
1 inch	100
3/4 inch	90 - 100
#4	35 - 65
#16	15 - 40

Standard Sieve Size	Percent Passing by Weight
#200	2 - 10

2.5 RCC MIXTURE PROPORTIONING

2.5.1 Composition

RCC mixture will be proportioned by the Contracting Officer. RCC shall be composed of cementitious materials, water, aggregates. The cementitious material shall be portland cement, or portland cement in combination with pozzolan.

2.5.2 Proportions

The proportions of all materials entering the RCC, as determined from the mixture proportioning studies, will be furnished to the Contractor by the Contracting Officer. The mixture proportions shall be changed by the Contractor during construction as directed by the Contracting Officer's representative. Adjustments will be made to the batch weights including cement, pozzolan, and water to maintain the necessary consistency to prevent segregation within the RCC and allow full compaction as determined. Frequent changes to the batch weights shall be considered usual and can be expected to occur frequently during the course of each day's placement depending on such variables as humidity, wind velocity, temperature, and cloud cover. Such changes will be as directed. The Contractor will be responsible for adjusting the aggregate weights to compensate for changes in aggregate moisture contents.

2.5.3 Deleted

2.5.4 Consistency of RCC

The Contracting Officer will determine at the placement site on a continuing basis the proper consistency necessary for adequate hauling, spreading, and compacting and will direct all necessary changes to achieve the proper RCC consistency. Changes will be directed based on visual examination of the RCC during the spreading and compaction process and on the Vebe time when it varies outside the range considered ideal for compaction, as determined by the Government using the modified Vebe apparatus, in accordance with COE CRD-C 53.

2.6 BEDDING MORTAR

2.6.1 General

Bedding mortar is to be used for achieving bond between RCC lifts as indicated in paragraph JOINTS. No surfaces to receive a bedding mortar shall be covered with RCC until the prepared surface has been approved and that acceptance has been recorded on an approved checkout form. In no case will the bedding mortar be allowed to dry from the sun and wind.

2.6.2 Bedding Mortar Mix

The bedding mortar mix design will be developed by the government and will

conform to the following general requirements. Aggregate for bedding mortar shall conform to the requirements of ASTM C 33, for washed concrete sand.

Parameter	
Slump	8-10 inches
Cement Content	**450-850 lb/yd^3**
Minimum Compressive Strength	(28 days) 2,000 psi

2.6.3 Installation

Bedding mortar shall be spread over the lift joint and other horizontal contact surfaces before placement of the next RCC lift. The bedding mortar shall be spread so that the maximum thickness of bedding does not exceed 1/2 inch, and the average thickness determined by dividing the volume used by the area covered is approximately 1/4 inch. Bedding mortar placements shall be controlled to prevent bleeding of the mortar through the RCC. The bedding mortar shall be covered with the designated RCC mix within 15 minutes after placement of the bedding mortar. Consolidation of the bedding mortar will not be required. Serrated rakes creating small windrows of mortar or other approved devices shall be used for mortar application.

2.7 **2.7 EPOXY RESIN**

Epoxy resins for use in repairs shall conform to ASTM C 881, Type III, Grade I or II.

PART 3 EXECUTION

3.1 STOCKPILING OF MATERIAL

3.1.1 General

Whether obtained from the required excavation or off-site commercial sources, aggregates shall not be transported directly to the mixing plant. The aggregates shall be stockpiled on firm ground drained and leveled, free of debris, trash, organic materials, and other objectionable or deleterious material. Stockpiles shall be constructed in layers not exceeding 3 feet in thickness. Ramps formed for the construction of stockpiles shall be made of the same material as that being stockpiled, and will be considered a part of the stockpile. Aggregates taken from the stockpile for RCC production shall be removed from the stockpile in such a manner that material from several layers of the stockpile are combined in each sample and the gradation of the aggregate obtained is representative of that used in the mix design tests.

3.2 EQUIPMENT

3.2.1 Capacity

The concrete plant, conveying, placing, compaction, and cleanup systems

shall have a capacity of at least 100 cubic yards per hour.

3.2.2 Concrete Plant

The concrete plant shall be a batch or a continuous mixing plant.

3.2.2.1 Location

The concrete plant shall be located on project site, subject to the approval of the Contracting Officer.

3.2.2.2 Bins and Silos

Separate bins, compartments, or silos shall be provided for each size or classification of aggregate and for each of the cementitious materials. The compartments shall be of ample size and so constructed that the various materials will be maintained separately under all working conditions. All compartments containing bulk cement or pozzolan shall be separated from each other by a free-draining air space. The cement and pozzolan bins shall be equipped with filters which allow air passage but preclude the venting of cement or pozzolan into the atmosphere. All filling ports shall be clearly marked with a permanent sign stating the contents.

3.2.2.3 Batch Plant

The batch plant requirements should meet the following requirements.

a. Batchers - Aggregate shall be weighed in separate weigh batchers with individual scales or may be batched cumulatively. Bulk cement and other cementitious materials shall each be weighed on a separate scale in a separate weigh batcher. Water shall be measured by weight or by volume. It shall not be weighed or measured cumulatively with another ingredient. Ice shall be measured separately by weight. Admixtures shall be batched separately and shall be batched by weight or by volume in accordance with the manufacturers recommendations.

b. Water Batcher - A suitable water-measuring and batching device shall be provided that will be capable of measuring and batching the mixing water within the specified tolerances for each batch. The mechanism for delivering water to the mixers shall be free from leakage when the valves are closed. The filling and discharge valves for the water batcher shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed. When a water meter is used, a suitable strainer shall be provided ahead of the metering device.

c. Admixture Dispensers - A separate batcher or dispenser shall be provided for the admixture. The plant shall be equipped with the necessary calibration devices that will permit convenient checking of the accuracy of the dispensed volume of the particular admixture. The batching or dispensing devices shall be capable of repetitively controlling the batching of the admixtures to the accuracy specified. Piping for liquid admixtures shall be free from leaks and properly valved to prevent backflow or siphoning. The dispensing system shall

include a device or devices that shall detect and indicate the presence or absence of the admixture or provide a convenient means of visually observing the admixture in the process of being batched or discharged. The system shall be capable of ready adjustment to permit varying the quantity of admixture to be batched. The dispenser shall be interlocked with the batching and discharge operations so that each admixture is added separately to the batch in solution in a separate portion of the mixing water in a manner to ensure uniform distribution of the admixtures throughout the batch during the required mixing period. Storage and handling of admixtures shall be in accordance with the manufacturer's recommendations.

d. Moisture Control - The plant shall be capable of ready adjustment to compensate for the varying moisture content of the aggregates and to change the masses of the materials being batched. A moisture meter complying with the provisions of COE CRD-C 143 shall be provided. The sensing element shall be arranged so that the measurement is made near the batcher charging gate of the fine aggregate bin.

e. Scales - Adequate facilities shall be provided for the accurate measurement and control of each of the materials entering each batch of concrete. The weighing equipment and controls shall conform to the applicable requirements of NIST HB 44, except that the accuracy shall be within 0.2 percent of the scale capacity. The Contractor shall provide standard test weights and any other auxiliary equipment required for checking the operating performance of each scale or other measuring device. Each weighing unit shall include a visible indicator that shall indicate the scale load at all stages of the weighing operation and shall show the scale in balance at zero load. The weighing equipment shall be arranged so that the concrete plant operator can conveniently observe the indicators.

f. Operation and Accuracy - The weighing operation of each material shall conform to requirements of NRMCA CPMB 100. The weigh batchers shall be so constructed and arranged that the sequence and timing of batcher discharge gates can be controlled to produce a ribboning and mixing of the aggregates, water, admixtures, and cementitious materials as the materials pass through the charging hopper into the mixer. The plant shall include provisions to facilitate the inspection of all operations at all times. Delivery of materials from the batching equipment shall be within the following limits of accuracy:

MATERIAL	PERCENT OF REQUIRED MASS
Cementitious materials	0 to +2
Water	+/- 1
Each individual aggregate size group	+/- 2

When water or chemical admixtures are measured by volume, they shall meet the same tolerance percent as stated in the chart.

g. Interlocks - Batchers and mixers shall be interlocked so that:

(1) The charging device of each batcher cannot be actuated until all scales have returned to zero balance within plus or minus 0.2 percent of the scale capacity and each volumetric device has reset to start or has signaled empty.

(2) The charging device of each batcher cannot be actuated if the discharge device is open.

(3) The discharge device of each batcher cannot be actuated if the charging device is open.

(4) The discharge device of each batcher cannot be actuated until the indicated material is within the allowable tolerances.

(5) Admixtures are batched automatically and separately with the water.

(6) The mixers cannot be discharged until the required mixing time has elapsed.

h. Recorder - An accurate recorder or recorders shall be provided and shall conform to the following detailed requirements:

(1) The recorder shall produce a graphical or digital record on a single visible chart or tape of the weight or volume of each material in the batchers at the conclusion of the batching cycle. The record shall be produced prior to delivery of the materials to the mixer. After the batchers have been discharged, the recorder shall show the return to empty condition.

(2) A graphical recording or digital printout unit shall be completely housed in a single cabinet that shall be capable of being locked.

(3) The chart or tape shall be so marked that each batch may be permanently identified and so that variations in batch weights of each type of batch can be readily observed. The chart or tape shall be easily interpreted in increments not exceeding 0.5 percent of each batch weight.

(4) The chart or tape shall show time of day at intervals of not more than 15 minutes.

(5) The recorder chart or tape shall become the property of the Government.

(6) The recorder shall be placed in a position convenient for observation by the concrete plant operator and the Government inspector.

(7) The recorded weights or volumes when compared to the weights or volumes actually batched shall be accurate within plus or minus

2 percent.

i. Batch Counters - The plant shall include devices for automatically counting the total number of batches of all concrete batched and the number of batches of each preset mixture.

j. Batch Plant Trial Operation - Not less than 7 days prior to commencement of placing the test section, a test of the batching and mixing plant shall be made in the presence of a representative of the Contracting Officer to check operational adequacy. The number of full-scale concrete batches required to be produced in trial runs shall be as directed, will not exceed 20, and shall be proportioned as directed by the Contracting Officer. All concrete produced in these tests shall be wasted or used for purposes other than inclusion in structures covered by this specification. All deficiencies found in plant operation shall be corrected to the satisfaction of the Contracting Officer prior to the start of concrete placing operations. No separate payment will be made to the Contractor for labor or materials required by provisions of this paragraph. Mixer uniformity testing, in accordance with paragraph CONTRACTOR QUALITY CONTROL, will be performed by the government near the end of this trial operation period. The Contractor shall notify the Contracting Officer of the trial operation not less than 7 days prior to the start of the trial operation.

k. Protection - The weighing, indicating, recording, and control equipment shall be protected against exposure to dust, moisture, and vibration so that there is no interference with proper operation of the equipment.

3.2.2.4 **3.2.2.4 Continuous Mixing Plant**

A continuous mixing plant(s) shall be capable of producing RCC of the same quality and uniformity as would be produced in a conventional batch plant and shall be capable of producing a uniform continuous product (at both maximum and minimum production rates) that is mixed so that complete intermingling of all ingredients occurs without balling, segregation, and wet or dry portions.

a. Operation and Accuracy - An electronic control system shall be provided. The control system shall have the capability of changing mixtures instantaneously, measuring the moisture in the combined aggregate entering the mixer, producing any of the mixtures at a variable rate, and tracking a mixture change to a hopper or a conveyor system. The control panel shall display for each ingredient the designed formula values and the instantaneous percentage values and shall record the instantaneous values at a preset time interval or on demand with a multiple copy printer/recorder. The recorder shall note formula changes and shall print total quantities of each ingredient and total amounts produced on command. There shall be weighing devices (belt scale or other) for continuous weighing of individual ingredients and total ingredients. The plant control shall not require manual devices to adjust the material flow. The plant shall be capable of total manual control operation for a single product at a

limited production for short-time durations in the event of loss of electronic control. The electronic control system shall incorporate modular replaceable components to reduce down time in the event of control system malfunction. An inventory shall be maintained of such replaceable components. The bin for the combined aggregate shall have a device that monitors its moisture content immediately prior to dispensing into the mixing plant dispensing system. The accuracy of the plant dispensing systems shall be within the following limits:

Portland Cement..... 0 to +2 percent
Pozzolan..... 0 to +2 percent
Water .....+/- 1 percent
Aggregate .....+/- 2 percent

The continuous feeders for each of the ingredients shall be calibrated as per the manufacturer's specifications. Devices and tools shall be maintained at the plant location to check the feeder's calibration at the Contracting Officer's request. A technician shall be provided that is skilled in calibration of the feed devices and the maintenance and repair of the plant control system. The technician shall be available within 30 minutes notice during all scheduled plant operations. The technician could be one or more of the Contractor's personnel.

b. Cement, Pozzolan, and Aggregate Feed - Cement, pozzolan, and aggregates shall be uniformly, continuously, and simultaneously fed (at the proper ratios and quantity for the mixture required) into the mixer by belt, auger, vane feeder, or other acceptable method. The feed bins or silos for each ingredient shall be kept sufficiently full and shall be of sufficient size to ensure a uniform flow at a constant rate for a specific mixture. The feed bins shall have a low-level indicator that both warns the operator and can shut the plant down if insufficient material is available for a uniform and continuous flow.

c. Water and Admixture Dispensers - The liquid-dispensing devices shall be capable of metering and dispensing within the specified requirements. The liquid valves shall be free from leakage in the closed position. The dispensers shall have attachments and/or be installed in such a manner that will permit convenient checking of their accuracy. Plumbing shall be leak-free and properly valved to prevent backflow and siphoning. The dispenser shall be interlocked with the electronic plant control and shall warn the operator and shut down the plant if insufficient liquid is available. Separate nozzles for each liquid shall be properly located at the mixer to assure uniform distribution of each liquid to the materials entering the mixer.

d. Continuous Mixer(s) - The continuous mixer(s) shall have proper introduction of ingredients as specified by the manufacturer and shall not be charged in excess of the manufacturer's recommended capacity. Mixer(s) shall be capable of combining the materials into a uniform homogeneous mixture and of discharging this mixture without segregation. The mixer(s) shall operate at the blade speed designated

by the manufacturer and shall be capable of changing retention time of the ingredients in the mixer. This should be accomplished by manually resetting the mixer(s) blade angles. Mixing time (ingredient retention time in the mixer) shall be predicated upon the uniformity, homogeneity, and consistency of the resultant mixture. Samples for uniformity testing shall be taken at 2-minute intervals and tested as per COE CRD-C 55. The mixer(s) shall be maintained in satisfactory operating condition and mixer blades shall be kept free of hardened concrete. Should mixer(s) at any time produce unsatisfactory results, its use shall be promptly discontinued until it is repaired. Suitable facilities shall be provided for obtaining representative samples of concrete for testing. All necessary platforms, shelters, tools, labor, and equipment shall be provided for obtaining samples.

e. Segregation - A means shall be used to reduce and minimize segregation and waste which would otherwise result from the continuous stream of RCC being fed into the batch haul devices (dump trucks, etc.). The equipment shall retain the RCC between tracks or other means of transport to prevent the need for stopping the mixer. These devices could include, but not be limited to, a discharge hopper having a capacity of at least 20 ton. The hopper shall be equipped with dump gates to assure rapid and complete discharge without segregation.

f. Trial operation - Not less than 7 days prior to commencement of concrete placing, a test of the plant shall be made in the presence of a representative of the Contracting Officer to check operational adequacy. The number of cubic meters required to be produced in trial runs shall be as directed, but will not exceed 100 cubic yards and shall be proportioned as directed by the Contracting Officer. All concrete produced in these tests shall be wasted or used for purposes other than inclusion in structures covered by this specification. All deficiencies found in plant operation shall be corrected to the satisfaction of the Contracting Officer prior to the start of concrete placing operations. Mixer uniformity tests by the Government will be performed near the end of this trial period. No separate payment will be made to the Contractor for labor or materials required by provisions of this paragraph. The Contractor shall notify the Contracting Officer of the trial operation not less than 7 days prior to the start of the trial operation.

g. Protection - The weighing, indicating, recording, and control equipment shall be protected against exposure to dust, moisture, and vibration so that there is no interference with proper operation of the equipment.

h. Deleted.

3.2.3 Mixers

Mixers shall be stationary mixers or pugmill mixers. Mixers may be batch or continuous mixing. Each mixer shall combine the materials into a uniform mixture and discharge this mixture without segregation. Mixers shall not be charged in excess of the capacity recommended by the manufacturer on the

nameplate. Excessive overmixing requiring additions of water will not be permitted. The mixers shall be maintained in satisfactory operating condition, and mixer drums shall be kept free of hardened concrete. Mixer blades or paddles shall be replaced when worn down more than 10 percent of their depth when compared with the manufacturer's dimension for new blades. Should any mixer at any time produce unsatisfactory results, its use shall be promptly discontinued until it is repaired or replaced.

3.2.3.1 Pugmill Mixers

A batch or continuous mixing twin-shaft pugmill mixer shall be capable of producing RCC of the same quality and uniformity as would be produced in a conventional plant that meets all the requirements of these specification. All pugmill mixers shall meet the requirements of paragraph CONTINUOUS MIXING PLANT.

3.2.3.2 Mixer Uniformity Requirements

All mixers shall be tested by the Government in accordance with this paragraph and in accordance with COE CRD-C 55. When regular testing is performed, the RCC shall meet the limits of any three of the four applicable uniformity requirements. When abbreviated testing is performed, the concrete shall meet only those requirements listed for abbreviated testing. The initial mixer evaluation test shall be a regular test and shall be performed prior to the start of concrete placement. The concrete proportions used for the evaluation shall contain the largest size aggregate on the project and shall be as directed by the Contracting Officer. Regular testing shall consist of performing all tests on three batches of concrete. The range for regular testing shall be the average of the ranges of the three batches. Abbreviated testing shall consist of performing the required tests on a single batch of concrete. The range for abbreviated testing shall be the range for one batch. Mixer evaluations shall be performed by the Government. The Contractor shall provide labor and equipment as directed by the Contracting Officer to assist the Government in performing the tests.

PARAMETER	REGULAR TESTS ALLOWABLE MAXIMUM RANGE FOR AVERAGE OF 3 BATCHES	ABBREVIATED TESTS ALLOWABLE MAXIMUM RANGE FOR 1 BATCH
Coarse aggregate, percent	6.0	6.0
Compressive strength at 7 days	10.0	10.0
Water content, percent	1.5	1.5
Consistency, modified Vebe, second	7.0	--

A regular test will be performed before concrete production begins and when the Contractor requests a reduced mixing time. An abbreviated test shall be performed every 3 months when concrete is being placed. If a mixer fails the abbreviated test, a regular test will be performed. Cost of testing when the Contractor requests a reduced mixing time will be paid by

the Contractor.

3.2.4 Sampling Facilities

3.2.4.1 Sampling Concrete

The Contractor shall provide suitable facilities and labor for obtaining representative samples of concrete in accordance with ASTM C 172 for Contractor quality control and Government quality assurance testing.

3.2.4.2 Sampling Aggregates

Suitable facilities shall be provided for readily obtaining representative samples of aggregates for test purposes immediately prior to the material entering the mixer.

3.2.5 Transporting and Conveying Equipment

The transporting and conveying equipment shall conform to the following requirements.

The concrete mixtures (RCC, bedding mortar) shall be conveyed from the plant mixer(s) to placement as rapidly and as continuously as practical by methods which limit segregation, contamination, and surface drying. The RCC shall be conveyed from the mixing plant to the structure by means of main-line conveyor, end-dump truck, or a combination thereof.

3.2.5.1 **3.2.5.1 Belt Conveyors**

Belt conveyors shall be designed and operated to assure a uniform flow of RCC from mixer to final place pf deposit without segregation of ingredients and shall be provided with positive means for preventing segregation of the RCC at transfer points and the point of placing. The NMSA required in mixture proportions furnished by the Government will not be changed to accommodate the belt width.

3.2.6 **3.2.6 Spreading and Remixing Equipment**

The spreading and remixing equipment shall conform to the following requirements:

The primary spreading procedure shall be accomplished by track dozer. The equipment shall be maintained in good operating condition. The equipment shall not leak or drip oil, grease, or other visible contaminants onto the RCC surface. All equipment used for spreading and remixing that leaves the surface of the structure for maintenance or repairs or, for any other reason, must be cleaned of all contaminants by an approved method before returning to the structure surface. Under no conditions shall a dozer or other tracked vehicle be operated on other than fresh uncompacted RCC except to facilitate startup operations for each lift and by approved procedures.

3.2.7 Compaction Equipment

The compaction equipment shall conform to the following requirements.

3.2.7.1 Primary Rollers

Self-propelled vibratory rollers shall be used for primary rolling and shall be double-drum. They shall transmit a dynamic impact to the surface through a smooth steel drum by means of revolving weights, eccentric shafts, or other equivalent methods. The compactor shall have a minimum gross mass of 20,000 lbs) and shall produce a minimum dynamic force of 4,000 lbf/ft of drum width. The operating frequency shall be variable in the approximate range of 1,700 to 3,000 cycles per minute. The amplitude shall be adjustable between 0.02 to 0.04 inches. The roller shall be capable of full compaction in both forward and reverse directions. The roller shall be operated at speeds not exceeding 2.3 ft/s. Within the range of the operating capability of the equipment, the Contracting Officer may direct or approve variations to the frequency, amplitude, and speed of operation which result in the specified density at the fastest production rate.

3.2.7.2 Small Vibratory Rollers

Small vibratory rollers shall be used to compact the RCC where the larger vibratory rollers specified above cannot maneuver. The rollers shall compact the RCC to the required density and shall be so demonstrated during construction of the test section. Small vibratory rollers cannot compact the RCC to the same density and thickness as the primary rollers; therefore, when small rollers are used, total lift thickness of the RCC layer or lift shall be reduced to not over 6 inches uncompacted thickness to permit adequate compaction. Rollers shall have independent speed and vibration controls and shall be capable of a wide range of speed adjustments.

3.2.7.3 Tampers (Rammers)

The tampers shall compact the RCC to the required density and shall be so demonstrated during construction of the test section. Tampers cannot compact the RCC to the same density and thickness as the primary rollers; therefore, when tampers are used, thickness of each RCC layer that is to be compacted shall be reduced to not more than 6 inches uncompacted thickness to assure adequate compaction.

3.2.7.4 **3.2.7.4 Other Motorized Equipment**

All other equipment necessary for the successful completion of RCC production, but not previously discussed within these specifications (or determined to be necessary during the course of the work), shall be approved prior to actual use. Such equipment shall not result in any damage to the RCC, shall be maintained in good operating condition, and shall be operated by skilled contractor-provided personnel.

3.2.8 **3.2.8 Nuclear Density Gauge**

Tests to determine the density of the compacted RCC shall be made by the Contractor using a single-probe nuclear density gauge supplied by the

Contractor. The nuclear density gauge shall meet the applicable requirements of ASTM C 1040. The gauge shall be capable of taking readings along a horizontal path between the probes at2-inchincrements from from the surface to below the surface. The gauge and operator shall be made available to the Government until completion of all RCC production at no additional cost. The Contractor shall obtain all permits and certifications for the equipment and the operators.

3.2.9 **3.2.9 Calibration**

Nuclear gauge shall have been factory calibrated within 6 months of RCC placement. The Contractor shall construct, at no additional costs to the Government, one (1) calibration test block using RCC materials and proportions representative of those to be used during construction. The block shall be fabricated before the test section construction begins. The block size shall be a minimum of 18-inch by 18-inch by the maximum thickness of one lift, plus 1 inch. The block shall be compacted between 98 and 100 percent of the maximum wet density, which will be determined by the Contractor in accordance with ASTM D 1557. The moisture content of the RCC used to fabricate the block may be increased just enough to facilitate compaction of the mixture, as long as the proportions of the dry materials remain constant and the required density is achieved. The block shall be measured and weighed to determine the actual density (unit weight) and shall be used to check the calibration of the nuclear density gauge. After drilling a hole in the block to accommodate the nuclear density gauge probe, three full depth nuclear density gauge tests shall be performed in the direct transmission mode and the results averaged. This average nuclear density gauge reading shall be compared with the measured unit weight of the block and the difference used as a correction factor for all readings taken that day. All measuring and weighing of the test block and all calibration checking of the density gauge shall be performed in the presence of a representative of the Contracting Officer. Calibration checks of the density gauge shall be made at the beginning of construction every day. Gauge calibration constants shall be adjusted for performance on the block at least 7 days prior to the evaluation of test sections. The Contractor shall remedy any inconsistencies in gauge performance prior to the start of RCC placement. The block shall be used each day before placing begins to calibrate the full-depth readings of the nuclear density gauges used by the Contractor and the Government. The calibration block shall be available for use by the Government as needed.

3.3 SUBGRADE PREPARATION

Previously constructed underlying material shall be conditioned as specified in Section 02250 FILLS AND SUBGRADE PREPARATION. The existing subgrade, other than specified fills, shall be scarified, conditioned to optimum moisture content, and compacted to at least 90 percent of maximum density in accordance with ASTM D 1557 for a depth of least 12 inches. In all cases prior to placing RCC, deficiencies in the underlying material shall be corrected, and the surface shall be cleaned and moistened, as directed. The surface of the underlying material will be approved by the Contracting Officer.

3.4 PREPARATION FOR PLACING

3.4.1 **3.4.1 Placing Schedule**

Before starting RCC production, a detailed schedule shall be submitted indicating intended daily and weekly production rates that, when followed, will meet the beginning and ending specified RCC production dates. After initiation of RCC production, the Contractor's schedule shall be updated and adjusted on a weekly basis for the duration of the RCC placement. If it becomes apparent for any reason that the Contractor is not pursuing a schedule that will meet the specified RCC production dates, actions necessary to increase the production rate shall be taken so that production is once again on schedule. Also, if not back on schedule, the Government reserves the right at this time to direct the Contractor, at no additional cost to the Government, to increase the amount and size of crews and equipment.

3.4.2 **3.4.2 Deleted**

3.4.3 **3.4.3 Aggregate Production Schedule**

Aggregate production and initial stockpiling shall begin and shall be producing acceptable material by not later than 60 days in advance of the time when placement of the RCC test section is expected to begin. At least 25 percent of the RCC aggregates necessary for the completed RCC construction shall be manufactured and stockpiled prior to start of placement of RCC.

3.4.4 **3.4.4 RCC Test Section**

3.4.4.1 **3.4.4.1 General**

Prior to placement of any RCC, the Contractor shall construct a test section at the job site. The purpose of the test section is to demonstrate the suitability of the Contractor's equipment, methods, and personnel. The test section shall consist of not less than two adjacent lanes, at least 100 feet in length. The section shall be constructed to at least the depth of 6 lifts. The lane width shall be 10 feet. The test section shall contain at least one fresh longitudinal construction joint, one cold transverse joint, one longitudinal cold construction joint which has stood overnight before completion, and one surface to be treated with bedding mortar. The site of the test section shall be approved by the Contracting Officer. After evaluation and assessment of the test section by the Contracting Officer, the Contractor shall dispose of the test section in an approved manner. Under no circumstances shall the test section be incorporated into or become a part of the permanent RCC structure. The date of the test section construction shall be provided at least 7 days in advance.

3.4.4.2 **3.4.4.2 Test Section Requirements**

The test section shall demonstrate sustained plant production rates, and batching, mixing, transporting, spreading, compaction procedures, curing and preparation of construction joints. It shall also demonstrate the vertical face construction method along one side (formed), procedures for

foundation preparation, procedures for placement of bedding mortar, rolling pattern, joint preparation, rolling method for both fresh and cold construction joints, start-up and finishing procedures, testing methods, and plant operations. Variable amplitudes of the roller shall be used as approved in different areas to identify the optimum amplitude. Rolling pattern of the vibratory roller may be varied as approved to determine the best pattern. Variations in mixture proportions other than water shall be made if directed. The test section shall be placed in portions as directed by the Government. Additionally, at least four (4) nuclear gauge readings at the last lift of the test section shall be provided from points selected by the Government. The Contractor shall vary the water content, as necessary, to arrive at the appropriate content, subject to the approval of the Contracting Officer's Representative. The mixing plant shall be operated and calibrated prior to placing the test section. The Contractor shall use the same equipment, materials, and construction techniques on the test section as will be used in all subsequent work.

3.4.4.3 **3.4.4.3 Evaluation of Test Section**

The Contractor shall not begin RCC operations for the main structure until testing and evaluations by the Government have been completed, and it has been demonstrated to the satisfaction of the Contracting Officer that all specification requirements were met. Following completion of test section construction, ten (10) calendar days shall be allowed for testing and evaluation. If the Contractor does not meet requirements as specified, an additional test section or sections shall be constructed at no additional cost to the Government. Test sections unacceptable to the Contracting Officer shall be removed at the Contractor's expense. The Contractor shall provide eight (8) 6-inch diameter cores by full lift thickness to the Government from points selected in the test section by the Government 7 days after completion of the test section. Four (4) additional cores shall be provided by the Contractor 28 days after completion of the test section.

3.4.5 Weather

If unusual adverse weather, such as heavy rain, severe cold, high winds, heavy snow, etc., occurs or is forecast to occur during placement, the placement operation shall be suspended until conditions improve.

3.4.5.1 Placing During Cold Weather

Placement shall be discontinued when the air temperature reaches 41 degrees F and is falling and shall not be resumed until the air temperature reaches 36 degrees F and is rising. No RCC shall be placed on any surface containing frost or frozen material. Provision shall be made to protect the RCC from freezing during the specified curing period. Mixing water and/or aggregates shall be heated, as necessary, to produce RCC having a temperature between 50 degrees F and 86 degrees F as placed. Methods and equipment for heating shall be as approved. The aggregates shall be free of ice, snow, and frozen lumps before entering the mixer. Covering and other means shall be provided for maintaining the RCC at a temperature of at least 50 degrees F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. RCC damaged by freezing shall be removed and replaced as directed.

3.4.5.2 Placing During Rain

RCC shall not be placed during rainfall of 0.2 in/hr or more. During periods of lesser rainfall, placement of RCC may continue if, in the opinion of the Contracting Officer, no damage to the RCC is occurring. Work shall commence only after excess free surface water and contaminated paste or RCC have been removed and the surface has gained sufficient strength (no less than 4 hours after the RCC placement was suspended) to prevent rutting, pumping, intermixing of rainwater with the RCC, or other damage to the RCC. When the RCC surface has been contaminated or damaged in any manner, the RCC surface shall be washed to break up and remove laitance and/or mud-like coatings from the surface. Any undercut coarse aggregate shall be removed. All waste shall be removed and disposed of in an approved manner.

3.4.5.3 Placing During Hot Weather

During periods of hot weather when the maximum daily air temperature is likely to exceed 86 degrees F; or when the combination of ambient conditions will produce evaporation rates of 0.2 lb/sq ft/hr or more, when calculated in accordance with Figure 2.1.5 of ACI 305R; the following precautions shall be taken. The underlying material shall be sprinkled with water immediately before placing the RCC. The RCC shall be placed at the coolest temperature practicable, and in no case shall the temperature of the RCC when placed exceed 90 degrees F. The aggregates and/or mixing water shall be cooled as necessary. The finished surfaces of the newly laid RCC shall be kept damp by applying a waterfog or mist, not streams of water, with approved spraying equipment until the RCC is covered by the curing medium. When heat or wind is determined excessive by the Contracting Officer, the Contractor shall immediately take such additional measures as necessary to protect the RCC surface. Such measures shall consist of wind screens, more effective fog sprays, and similar measures commencing immediately after placement. If these measures are not effective, placement shall be immediately stopped until satisfactory conditions exist.

3.4.6 Surface Preparation

3.4.6.1 Cleaning

All lift surfaces including any RCC or bedding mortar shall be cleaned prior to placing any additional concrete thereon. After cleaning, bedding concrete and bedding mortar are to be used specifically for achieving bond between different types of concrete eliminating and preventing segregation or voids along margins or RCC placements. No surfaces to receive bedding mortar shall be covered with RCC until the prepared surfaces have been accepted in writing and that acceptance has been recorded on an approved checkout form. All surfaces upon which RCC, structural concrete or any bedding mortar or bedding mix is placed shall be moist (but contain no visible free water). Prior to placing any concrete adjacent to the RCC and/or the ogee section, the surface shall be clean and free of loose, or unkeyed rock; all mud and silt accumulations; laitance; puddles or ponds of free surface water; coatings; and any other detrimental materials.

High-pressure water jetting, and/or wet sandblasting, followed by mild high-volume, low-pressure washing, shall be used on all hardened RCC surface (cold joints) as necessary for the removal of laitance, coatings, stains, or other difficult-to-remove contaminants. High-volume low-pressure water washing and/or water jetting may be used for removal of loose materials.

3.4.6.2 High-Volume Low-Pressure Washing

Washing of loose materials can be accomplished with high-volume low-pressure water washing and/or air water jetting using equipment of similar design to that used in large-scale foundation cleanups. The air-water jets shall have 1-1/2 inch nozzles, a water supply of at least 30 gpm, and compressed air at the jet of 80 to 125 psi. The low-pressure water jets shall have 1 inch nozzles available and a capacity of at least 200 gpm for truck-mounted devices.

3.4.6.3 High-Pressure Water Jet

A stream of water under a pressure of not less than 1,500 psi for RCC shall be used for cleaning all cold joint surfaces, or surfaces with laitance, mortar coatings, stains, or other difficult-to-remove contaminants. There shall be no undercutting of coarse-size aggregates. Aggregate particles that are undercut shall be removed.

3.4.6.4 Wet Sandblasting

This method may be used when the RCC has reached sufficient strength to prevent undercutting of coarse aggregate particles. Wet sandblasting shall be continued until all accumulated laitance, coatings, stain, or other difficult-to-remove contaminants are removed. Wet sandblasting may be used in lieu of or in combination with the high-pressure water jet.

3.4.6.5 Waste Disposal

Any waste water employed in cutting, washing, and rinsing of concrete surfaces, and any other surface water shall not stain, or affect exposed surfaces of the structure(s) or damage the environment of the project area.

3.5 **3.5 PLACING**

3.5.1 **3.5.1 Procedures**

Placement of RCC shall be of such depth that when compacted, the surface will conform with cross section, grade, and contour indicated. Each lift shall be completed in its entirety across the full surface of the mass. RCC shall be placed in successive horizontal layers. Placing of mixture shall be as nearly continuous as possible, with an absolute minimum of stops and starts; speed of placing shall be controlled, to permit proper rolling. The timing of placement shall be controlled so that RCC mixtures shall be placed and rolled within the time limit specified in paragraph COMPACTION. Placing shall be discontinued during rain except for light mists which do not cause intermixing of cement and water slurry on the surface. Placing shall be done in a pattern so that curing water from

previous placements will not pose a runoff problem on the fresh surface. The contractor shall use care to minimize the production of cold joints.

3.5.2 **3.5.2 Bedding Mortar**

The bedding mortar shall be applied to the existing surface following any required cleanup. The bedding mortar shall be applied not more than 15 minutes ahead of RCC placement, unless otherwise approved. The bedding mortar shall be used between different RCC placements where cold joints occur, and other locations as directed or as shown in the drawings. The bedding mortar shall have an average thickness after application of between 1/4 and 1/2 inch and shall cover 100 percent of the lift area. Temperature of the mortar shall not exceed 85 degrees F when measured in accordance with ASTM C 1064. Bedding mortar shall be placed within 30 minutes after discharge into nonagitating equipment. When mortar is truck-mixed or when a truck mixer or agitator is used for transporting mortar mixed by a concrete plant mixer, the mortar shall be delivered to the site, and discharge shall be completed within 11/2 hours after batching.

3.5.3 **3.5.3 Lift Thickness**

The total lift thickness after final compaction by the vibratory roller shall not exceed 12 inches.

3.5.4 **3.5.4 Depositing, Spreading, and Remixing**

After the RCC has been deposited, the RCC shall be spread by dozers into gently sloping layers, approximately 6 inches thick, that will, after final compaction of the several layers by the vibratory roller, result in the specified lift thickness. During the spreading process, the dozer operators shall continuously work the RCC surfaces with the dozer blade in a manner to remix any RCC that may contain pockets of segregated material and to compact the material. A front-end loader with operator shall be available to assist with depositing and spreading RCC as needed in confined areas, and at other locations approved or directed. In no case shall the RCC, or bedding mortar be allowed to dry. Under no conditions shall a dozer or other tracked vehicle be operated on other than fresh uncompacted RCC except at the start of each lift placement to facilitate startup operations, and then only by an approved procedure. No RCC shall be placed on a previous lift which has not met specification. Unacceptable material shall be removed.

3.6 **3.6 COMPACTION**

After spreading and working with the dozers, the top surface of each lift shall be compacted with a self-propelled double-drum vibratory roller operating in the vibratory mode as are required to obtain the minimum compaction specified. A round trip over the same material shall count as two passes (i.e., from point A to point B and return to point A by the same route is two passes). Rolling shall begin within 10 minutes of spreading and, except for fresh joints, rolling shall be completed within 45 minutes of start of mixing, except during hot or dry weather conditions, as described in paragraph Placing During Hot Weather. In hot or dry weather, rolling shall begin within 5 minutes of spreading, and except for joints,

rolling shall be completed within 30 minutes of start of mixing. Delays in rolling freshly laid mixture will not be permitted. Rollers shall not be operated in the vibratory mode when not moving. The frequency and amplitude of vibration shall be varied, as needed or directed, within the range specified in paragraph EQUIPMENT. Surfaces of roller drums shall be kept clean at all times. At no time shall water be added during compaction operations to the uncompacted RCC mixture. If in the opinion of the Contracting Officer, the surface of a layer of RCC has been rutted or compacted unduly by hauling equipment so as to reduce the effectiveness of compaction by the specified rollers, the Contractor will be required to scarify such surfaces as directed prior to compacting with the specified rollers. At the start of compaction, the mixture shall be in a uniform, loose condition throughout its full depth. Compaction of each layer shall be done in such a manner as to produce a dense surface.

3.6.1 **3.6.1 Optimum Compaction Density (OCD)**

3.6.1.1 **3.6.1.1 General**

The Optimum Compaction Density (OCD) will be determined during placement of demonstration sections using the supplied mix design and Contractor supplied aggregates, materials, and equipment. The OCD method will be used to determine the requirement for achieving minimum density. All OCD determinations shall be performed by the Contractor in the presence of the Contracting Officer. The OCD will be invalid if material proportions, including water, are outside the designated ranges. OCD demonstration strip compaction will commence no later than 10 minutes after mixing of the RCC. Upon completion of the OCD demonstration section the Government shall provide the Contractor with procedural placement requirements and the Contractor shall proceed with RCC production placement.

3.6.1.2 **3.6.1.2 Determination of OCD**

The OCD value will be determined during placement of RCC demonstration section. The density of the RCC shall be determined for every one (1) or two (2) passes of compaction equipment, concurrently on the same demonstration section in 2 locations. Compaction shall continue until the change in density decreases significantly. The OCD shall be the average maximum recorded density. A variation in OCD from the two locations of more than 2 lbs/ft^3 shall invalidate the test and require that another test set be performed. The number of roller passes to achieve OCD shall be a guide to the equipment operators of the required compaction necessary to achieve OCD.

3.6.2 **3.6.2 Required Compaction Density**

RCC layers shall be compacted to at least 98 percent of the Optimum Compaction Density (OCD).

3.6.3 Operation of Rollers and Tampers

Speed of rollers shall be slow enough at all times to avoid displacement of the RCC but in no case more than 1.6 mi/hr. Displacement of RCC resulting from reversing direction of roller or from any other cause shall be

immediately corrected. Alternate passes of the roller shall be varied slightly in length and shall overlap sufficiently to provide full coverage over the surface. Additional rollers shall be furnished if RCC density specified is not attained and/or if placing operations are getting ahead of rolling. In no case shall the Contractor allow placing operations be altered without approval of the Contracting Officer's Representative. Places inaccessible to large vibratory rollers shall be thoroughly compacted with walk-behind rollers and hand-tampers to the required density, using multiple thin lifts, as necessary. Additional field density tests shall be made for those areas by the Contractor and may also be made by the Government.

3.6.4 **3.6.4 Rolling Pattern**

Rolling shall commence at the outer edge of the lane or lift abutting either a bulkhead, previously compacted RCC, or a construction joint. On subsequent adjacent lane or lift, rolling shall begin at the outer edge. The first pass along each edge shall extend to within approximately 18 inches of the edge except as otherwise approved or directed. If there will be a subsequent lane placed along an edge and the joint will be constructed as a "fresh" joint, the roller shall go no closer to the outer edge until the subsequent lane is placed. If there will be a subsequent lane and the joint will be treated as a "cold" construction joint, or if the edge will be the final edge of the RCC, the outer 18 inches shall be rolled after rolling of the center of the lane. If the edge abuts a previously placed strip, either as a "fresh" joint or as a "cold" joint, the uncompacted joint area shall be rolled after the center of the lane. This joint area shall be given additional passes of the vibratory roller, as necessary, to produce the specified compaction in the joint area. Approved hand-finishing operations shall be used as necessary to produce a tight surface at the joint. The rolling pattern shall be used consistently throughout production.

3.7 JOINTS

Joints shall conform to the details indicated and shall be perpendicular to the finished grade of the RCC. Joints shall be straight and continuous from edge to edge. Construction joints shall be made to ensure continuity in smoothness and grade between old and new sections of RCC, as specified hereinafter. All joints shall have the same texture, full-depth density, and smoothness as specified for other sections. Regardless of age, contact surfaces of previously constructed strips that have become coated with dust, sand, or other objectionable material shall be cleaned by brushing or cut back with approved power saw, as directed.

3.7.1 Lift Joints

The entire RCC shall be placed with sufficient continuity so that it hardens and acts as one monolithic structure without discontinuous joints or potential planes of separation. All lift joints shall be kept clean, uncontaminated, free from ponded water, and continuously moist until placement of the succeeding RCC. Regular lift-joint treatment and maintenance applies to subsequent lifts placed within 2 hours of the previous lift and shall include:

a. Moisture Condition. Maintaining 100 percent of each compacted lift-joint surface continuously moist by application of water.

b. Removing all loose contaminants or deteriorated RCC by low pressure washing and vacuuming, and

c. Exception for Hot Weather Conditions. During periods of hot weather as defined in Paragraph: Placing During Hot Weather, the time period for regular lift joint treatment shall be reduced to 1-hour. After 1 hour, the requirements of 3.7.1.1 shall apply.

3.7.1.1 Subsequent Lift Placed Within 2 to 4 Hours

If Lift joints that have not hardened or dried and are less than 4 hours old shall be given the regular lift-joint treatment:

a. Moisture Condition. Maintaining 100 percent of each compacted lift-joint surface continuously moist by application of water.

b. Air Jetting. Removing all loose contaminants or deteriorated RCC by high pressure, high volume air jetting and vacuuming. The air-jetting is intended is to be applied so that only the loose surface skin or mortar is removed and there is no undercutting of coarse-aggregate particles. The surface shall be completely free of all loose material and ponded water prior to placement of the subsequent lift.

c. Exception for Hot Weather Conditions. During periods of hot weather as defined in Paragraph: Placing During Hot Weather, the time period forregular lift joint treatment shall be reduced to 2-hours. After 2 hours, the requirements of 3.7.1.2 shall apply.

3.7.1.2 Subsequent Lift Placed Within 4-8 Hours

When placement of the overlying lift does not occur within 4 hours the surface prior to placement shall be treated by air-water cutting.

a. The air pressure used in the jet shall be 90 to 110 psi, and the water pressure shall be just sufficient to bring the water into effective influence of the air pressure. After cutting, the surface shall be washed and rinsed until the wash water is no longer cloudy. Surfaces shall be inspected and approved by the Contracting Officer.

b. During periods of hot weather as defined in Paragraph: Placing During Hot Weather, the time period shall be reduced to 4-hours. After 4-hours the requirements of 3.7.1.3 shall apply.

3.7.1.3 Subsequent Lift Placed More Than 8 Hours

When placement of the overlying lift does not occur within 8 hours the surface prior to placement shall be treated by air-water cutting as indicated in the paragraph: Subsequent Lift Placed 4-8 Hours Later and the application of a bonding layer. During periods of hot weather as defined

in Paragraph: Placing During Hot Weather, the time period shall be reduced to 4-hours.

3.7.2 **3.7.2 Longitudinal Construction Joints**

Any construction joints in which the edge of the initial strip has exceeded the time requirements given in paragraph PLACING shall be considered "cold joints" and shall be trimmed by cutting back into the complete lift to form a full-depth vertical face and the excess material removed. This vertical face shall be dampened before the placement of the fresh lane begins.

3.7.3 **3.7.3 Transverse Construction Joints**

When a transverse construction joint is required, the roller shall pass over the end of the freshly placed RCC. In these cases, the previously placed materials shall be cut to full depth of the lift, and the excess material removed. Transverse joints may also be formed by using bulkheads and forms to provide a full-depth vertical face. This vertical face shall be dampened before the placement of the fresh lift begins.

3.8 CURING AND PROTECTION

3.8.1 General

Temporarily exposed surfaces of RCC that will be in contact with succeeding layers of RCC shall be kept continuously moist by moist curing method described hereinafter until placement of the subsequent layer. Curing of permanently exposed surfaces shall begin immediately after compaction and shall continue for at least 14 days. When wood or metal forms are left in place during curing, the forms shall be kept continuously wet. RCC shall be cured and protected from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage and exposure to rain or flowing water. The Contractor shall have all equipment needed for adequate curing and protection on hand and ready to install before actual placement begins. The curing medium and method, or the combination of mediums and methods used, shall be approved by the Contracting Officer. The RCC shall be protected from the damaging effects of rain for 12 hours and flowing water for 14 days.

3.8.2 **3.8.2 Moist Curing**

RCC will be moist cured by maintaining all surfaces continuously, not periodically, wet for the duration of the entire curing period. Water for curing shall comply with the requirements of paragraph: WATER. If water is used which stains or discolors RCC surfaces which are to be permanently exposed, the surfaces shall be cleaned to the satisfaction of the Contracting Officer. Horizontal surfaces may be cured by covering with a minimum uniform thickness of 6 inches of continuously saturated sand. Temporarily exposed surfaces may not be cured by saturated sand.

3.8.3 Truck Applications

Water trucks shall be used, as necessary, to keep surfaces wet at all times until a sprinkler system, wet burlap covering, or final curing method is

implemented. The water truck shall be supplemented, as necessary, by mists from hand-held hoses. The truck operator shall be positioned so he is capable of seeing the spray at all times. The spray shall be capable of easy direction, either by attachment to the front of the truck so it can be directed by steering the truck or by other approved means. All spray nozzles both on the trucks and the hand held hoses shall be of a type that produces a true fog spray without any concentrated streams of water. The mist shall not be applied in a channelized or pressurized manner that in any way erodes the surface of the RCC. It shall also be applied at a rate which does not cause ponding at the surface. Trucks shall not be allowed to drop visible oil or other contaminants on the surface. If trucks must leave the surface, the tires shall be washed free of dirt or other foreign material before returning to the surface. Water truck wheel loads shall not exceed 2000 kg (4409 lbs) and shall be such that no cracking or other damage to the RCC is caused.

3.8.4 Sprinkler System

An approved sprinkler system consisting of pipe lines and rotating or other approved type of sprinklers may be used. Sprinklers shall deliver a fine mist of water and shall not cause any erosion to the surface of the RCC. The sprinkler system shall cover all portions of the RCC surface, and keep the surface wet at all times.

3.8.5 Burlap

Burlap covers shall consist of two or more layers of burlap having a combined weight of 1 lb per square foot in a dry condition. Burlap shall be either new or shall have been used only for curing RCC or conventional portland cement concrete. Burlap strips shall have a length after shrinkage of at least 12 inches greater than necessary to cover the entire width and edges of the RCC. Mats shall overlap each other at least 6 inches. Mats shall be thoroughly wetted before placing and shall be kept continuously wet and in intimate contact with the surface and edges of the area for the entire specified curing period.

3.8.6 Cure Water Runoff Control

Any water applied to the surface of the RCC or burlap during curing that is in excess of the amount needed to keep the surface of the RCC continuously wet shall be controlled from running onto the base course and causing ponding on the base course or saturation of the base or subbase material.

3.8.7 Protection of RCC

After final rolling of the RCC, no vehicular traffic, except for pneumatic-tired water spray trucks or other curing equipment having wheel loads not exceeding 4,000 lbs shall be permitted on the RCC until the end of the curing period. No traffic or equipment shall be allowed on the surface that will cause any damage to the surface. Plastic sheeting meeting the requirements of ASTM C 171 shall be provided and kept readily available to cover RCC less than 12 hours old if rainfall occurs.

3.9 FORMED VERTICAL FACINGS FOR RCC SPILLWAY

The vertical faces of the RCC spillway are to be constructed using a form similar to conventional concrete forms. The vertical facings system shall be demonstrated on one side of the RCC test section.

3.9.1 **3.9.1 Forms for Vertical Facing**

Vertical and near-vertical facings shall be as shown in the drawings. The contract drawings are based on designs whereby all vertical and near-vertical faces are constructed at the same time and placement rate of each RCC lift. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the Contractor. The formwork shall be designed for loads, lateral pressure, and allowable stresses in accordance with ACI 347R. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the RCC and shall have sufficient rigidity to maintain specified tolerances. Vertical formwork shall be constructed such that forms are full wall height and shall be left in place (at a minimum) for all vertical layers/lifts of RCC for that wall section. The required sequence of construction operations after all forms and surface preparations have been approved is: place the uncompacted RCC (at the specified lift thickness) at full width against the forms; using dozer action, spread each thin RCC layer abutting against the forms, compact the RCC using the vibratory roller except the step edge shall be compacted with a hand-held tamper or vibrating plate compactor. Extreme care shall be taken to assure all time restrictions are met and to prevent the occurrence of any openwork, honeycombing, or voids at the formed RCC surface. Defective surfaces shall be repaired in accordance with the provision of this specifications. The Contractor's construction techniques and equipment used including form anchor capability, and required elapsed time for form stripping shall be satisfactorily demonstrated during construction of the test section.

3.10 **3.10 DEFECTIVE AREAS AND SURFACES**

Mixtures that become contaminated or are defective shall be removed. Skin patching of an area that has been rolled will not be permitted. Defective surfaces including spalls, excessive rock pockets, or voids in the RCC surfaces (both horizontal and vertical surfaces) shall be repaired as described in paragraph SURFACE REPAIR. No additional payment will be made to the Contractor for the repair of the defective areas and surfaces.

3.10.1 **3.10.1 Surface Repair**

Horizontal surface and vertical (formed) surface shall have surface defects repaired as follows: defective areas, spalls, and voids shall be chipped, cleaned, epoxy-coated, and filled with dry-packed mortar. Spalled areas shall be prepared by dovetailed saw cut (in a rectangular pattern) to a minimum depth of 1 inch or to such depth to expose a sound RCC surface at a minimum distance of 1 inch outside the farthest edge of the spall. The prepared areas shall be brush-coated with an epoxy resin meeting the requirements of paragraph EPOXY RESIN. All holes or voids left in the RCC as a result of form stakes removal shall be filled immediately with a cement grout, as directed.

3.10.2 **3.10.2 Material and Procedure for Repair**

The cement used in the dry-packed mortar shall be a blend of the cement used for production of RCC and white portland cement properly proportioned so that the final color of the mortar will match adjacent RCC. Trial batches shall be used to determine the proportions required to match colors. Dry-packed mortar shall consist of one part cement to two and one-half parts fine aggregate. The fine aggregate shall meet the grading and quality requirements of ASTM C 33. The mortar shall be remixed over a period of at least 30 minutes without addition of water until it obtains the stiffest consistency that will permit placing. Mortar shall be thoroughly compacted into the prepared areas by tamping, rodding, etc. and struck off to match adjacent RCC. The repaired areas shall be cured for 7 days. Other methods and materials for repair may be used only when approved in writing by the Contracting Officer.

3.11 **3.11 FINISHING SURFACE FOR RCC**

After compaction to the required lines and grades as shown in the drawings, RCC finished surfaces shall be smooth and free from rock pockets and surface voids.

3.12 **3.12 CONTRACTOR QUALITY CONTROL**

3.12.1 **3.12.1 General**

The Contractor shall perform the inspection and tests as described below, and based upon the results of these inspections and tests, he shall take the action required and submit reports as required. When, in the opinion of the Contracting Officer, the RCC operation is out of control, RCC placement shall cease. The laboratory performing the tests shall conform to ASTM E 329. Any test results requested by the Government for review shall be provided to the Government immediately, and all results of every test by the Contractor shall be furnished to the Government on a daily basis, not later than the day after the test or inspection is made. Verification tests of materials and RCC, if made by the Government, shall in no way relieve the Contractor from the testing requirements specified herein.

3.12.2 **3.12.2 Testing and Inspection Requirements**

3.12.2.1 **3.12.2.1 Calibration of Mixing Plant**

a. Batch-Mixing Plants: Accuracy of the batching equipment shall be checked for each type of cementitious material and aggregate at the beginning of operations and at least once for every 10 shifts in the presence of the Contracting Officer. Such checks shall also be made whenever there are variations in properties of the fresh RCC which could be the result of batching errors. Standard test weights accurate to plus or minus 0.1 percent shall be provided for checking plant scales.

b. Continuous-Mixing Plants: Accuracy of proportioning of the continuous-mixing plant shall be checked for each cementitious material every day at the beginning of operations and for aggregate at the beginning

of construction and after every 10 shifts. The accuracy of proportioning shall be checked by simultaneously securing timed samples of the cementitious materials and the aggregate as they are fed to the mixer and weighing each as appropriate.

c. Mixing Time: Mixing time of the pug mill shall be checked at the direction of the Government. Unless otherwise required, determination of mixing time shall be by weight method using the following formula:

Mixing time in seconds = pug mill dead capacity in pounds/pug mill output in pounds per second

3.12.2.2 **3.12.2.2 Quality of Aggregates**

a. Frequency of Quality Tests - Prior to submitting samples for mixture proportioning studies, the Contractor shall perform the tests for specific gravity, friable particles, soft particles, and other tests as specified in paragraph AGGREGATES. In addition, after the start of RCC placement, the Contractor shall perform tests for aggregate quality during RCC or aggregate production. Tests for quality shall be performed at least once for each 5,000 cubic yards of placed RCC or produced aggregate and otherwise when there may be a visual change in the aggregate.

b. Corrective Action for Aggregate Quality - If the result of a quality tests fail to meet the requirements during submittal of samples for mixture-proportioning studies, production procedures or materials shall be changed and additional tests shall be performed until the material meets the specified requirements prior to proceeding with the mixture-proportioning studies. If the aggregates still fail the tests, the fact shall be reported to the Contracting Officer and immediate steps shall be taken to rectify the situation.

3.12.2.3 **3.12.2.3 Aggregate Moisture Content**

When in the opinion of the Contracting Officer the electric moisture meter is not operating satisfactorily, there shall be at least two tests for moisture content in accordance with ASTM C 566 during each 8-hour period of mixing plant operation. The times for the tests shall be selected randomly within the 8-hour period. Additional tests shall be made whenever excessive variation in workability is reported by the placing foreman. The results of tests for moisture content shall be used to adjust the added water in the control of the mixing plant.

3.12.2.4 **3.12.2.4 Sieve Analysis**

a. Grading - Before starting work, at least one sample of aggregate shall be tested in accordance with ASTM C 136 and ASTM C 117. The aggregate shall not be used unless results verify that the aggregate complies with the specified gradation. After the initial test, a minimum of one analysis shall be performed for each 500 cubic yards or portion thereof of RCC material placed each shift. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor shall be responsible for delivering the aggregate

to the mixer within specification limits.

b. Corrective Action for Grading - When deficiences in grading are found, the rate of testing shall be increased as directed. When two consecutive tests show the aggregate to be deficient in grading, the mixing operation shall be stopped until acceptable material is furnished for delivery to the mixer.

3.12.2.5 **3.12.2.5 Scales**

a. Weighing Accuracy - The accuracy of the scales shall be checked by test weights at least once a month for conformance with the applicable requirements of paragraphs BATCH PLANT and CONTINUOUS MIXING PLANT. Such tests shall also be made as directed whenever there are variations in properties of the fresh RCC that could result from batching errors.

b. Batching and Recording Accuracy - Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. The Contractor shall confirm that the calibration devices described in paragraph BATCH PLANT are operating properly. If a continuous mixing plant is provided, the accuracy and operation of all feeding and dispensing units shall be checked before the start of operation each day.

c. Scales Corrective Action - When the weighing accuracy or batching accuracy does not comply with specification requirements, the plant shall not be operated until necessary adjustments or repairs have been made. Discrepancies in recording accuracies shall be corrected immediately.

3.12.2.6 **3.12.2.6 Mixing Plant Control**

The measurement of all constituent materials including cementitious materials, aggregate, and water shall be continuously controlled. The aggregate weight and amount of added water shall be adjusted as necessary to compensate for free moisture in the aggregates. A report shall be prepared indicating type and source of cement used, type and source of pozzolan used, and aggregate source, during plant operation.

3.12.2.7 **3.12.2.7 Field Density and Moisture Testing**

a. Testing and Checking - Density and moisture content shall be determined for each 1000 square feet of completed lift, with a calibrated nuclear density gauge in accordance with ASTM C 1040. Additional tests shall be made, as directed, particularly during start-up and when problems with attaining the required density occur. Field density tests shall be performed as soon as possible, but within 30 minutes, after the completion of vibratory rolling. Each test shall include readings taken at incremental depths of 2 inches to depth of 10 inches. Only the deepest reading shall be used to evaluate the density. Both wet and dry densities shall be reported, and all individual readings shall be reported; however, only the wet

density shall be used for evaluation. The moisture content shall be determined in accordance with ASTM D 3017 at the same depths.

b. Action Required - Whenever the nuclear gauge indicates density less than the specified density, a retest shall be made. If the retest indicates unacceptable density, the Contracting Officer's Representative shall be notified, additional rolling shall be immediately provided, and a determination shall be made as to whether the lower density resulted from insufficient passes of the roller or a change in the mix properties. If the mix properties have changed, adjustments such as increasing or decreasing the moisture content shall be made at the batch plant. If the problem persists, the Contracting Officer may adjust the proportions of aggregates, cement, and/or pozzolan. If the lower density is the result of incomplete rolling, the operator shall be notified and the Contracting Officer may require removal of the incompletely compacted material at no cost to the Government.

3.12.2.8 **3.12.2.8 Moisture Content of RCC**

a. Testing and Checking - Moisture content of the RCC mix shall be determined for at least once during each four hours of production at the mixing plant, and once every two hours at the placement site, with a calibrated nuclear density gauge in accordance with ASTM C 1040. If, after five days of production placement, consistent moisture content is achieved, the rate of testing shall be decreased as directed.

b. Corrective Action - The placing foreman shall continuously monitor the apparent effectiveness of compaction equipment from a visual standpoint, and shall notify the mixing plant whenever the mix becomes too dry or too wet. Whenever moisture content tests indicate a change from what has been established as the optimum batching and placing moisture for maximum density and efficiency of compaction equipment, an adjustment shall be made in the mix water added at the mixing plant and the adjustment shall be noted.

3.12.2.9 **3.12.2.9 Inspection Before Placing**

Construction joints and other horizontal surfaces shall be inspected by the Contractor in sufficient time prior to the next lift placement to certify to the Contracting Officer that they are ready to receive RCC. The results of each inspection shall be reported in writing. The inspection of the lift surfaces of the RCC will be a continuing activity and shall be accomplished in accordance with paragraphs SURFACE PREPARATION and JOINTS.

3.12.2.10 **3.12.2.10 Inspection During Placing**

a. Inspection - The Contractor shall provide full time supervision of all placing operations to insure that the correct quality of RCC or bedding mortar are performed in accordance with the contract. During placing operations, the quality control staff shall measure and record RCC temperatures in accordance with ASTM C 1064, ambient temperature hourly, record weather conditions, time of placement, volume placed,

and method of placement.

b. Cold-Weather Placing - At least once during each shift, an inspection shall be made of all areas subject to cold-weather protection. Deficiencies shall be noted. During removal of protection, the RCC temperature and ambient temperature shall be measured at least hourly.

c. Hot-Weather Placing - When the maximum daily air is likely to exceed 85 degrees F, the Contractor shall take and record the temperature of the mixture at 30-minute intervals during hot-weather placement. The surface of the subgrade or RCC shall be inspected to assure that it is sprinkled with water immediately before the next layer of RCC is placed and any deficiencies noted.

d. Corrective Action - The placing foreman shall not permit RCC placing to begin until he has verified that necessary equipment are all in working order and with competent operators. Placing shall not be continued if any lift of RCC is not fully compacted.

e. Temperature Protection - The Contracting Officer shall be notified whenever the RCC temperature during the period of protection or protection removal fails to comply with the specifications, and immediate steps shall be taken to correct the situation. Regardless of the ambient temperature, when the temperature of the RCC mixture exceeds 90 degrees F, mixing and placing shall be stopped and the Contracting Officer notified.

3.12.2.11 **3.12.2.11 Curing Inspection**

a. Moist Curing Inspections - At least twice each shift, and twice per day on non-work days an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded.

b. Moist Curing Corrective Action - When a daily inspection report lists an area of inadequate curing, immediate corrective action shall be taken, and the required curing period for those areas shall be extended by one day.

3.12.2.12 **3.12.2.12 Cold-Weather and Hot-Weather Protection**

At least once each shift and once per day on nonwork days an inspection shall be made of all areas subject to cold-weather or hot-weather protection. Any deficiencies shall be noted, corrected, and reported.

3.12.2.13 **3.12.2.13 Cold-Weather and Hot-Weather Protection Corrective Action**

When a daily inspection report lists deficiencies, the deficiency shall be corrected immediately and the period of protection extended for one day.

3.12.3 **3.12.3 Reports**

All results of tests conducted at the project site shall be reported daily and shall be delivered to a designated representative of the Contracting Officer. During periods of cold weather protection, reports of pertinent temperatures shall be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in preceding paragraphs. Such reports of failure 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 at any time.

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DIVISION 05 - METALS

SECTION 05500

MISCELLANEOUS METAL

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SECTION 05500

MISCELLANEOUS METAL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M	(1997a) Carbon Structural Steel
ASTM A 53/A 53M	(1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A 123/A 123M	(1997a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 276	(1998b) Stainless Steel Bars and Shapes
ASTM A 320/A 320M	(1999) Alloy Steel Bolting Materials for Low-Temperature Service
ASTM B 32	(1996) Solder Metal
ASTM C 94/C 94M	(2000) Ready-Mixed Concrete

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(2000) Structural Welding Code - Steel

ASME INTERNATIONAL (ASME)

ASME B18.2.1	(1996) Square and Hex Bolts and Screws (Inch Series)
ASME B18.2.2	(1987; R 1993) Square and Hex Nuts (Inch Series)

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1925	(Rev A; Notice 1) Shield, Expansion (Nail Anchor)

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation;

submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Miscellaneous Metal Items; FIO

Detail drawings indicating material thickness, type, grade, and class; dimensions; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates. Detail drawings for the following items: hand rail, access gates, and other miscellaneous metalwork.

1.3 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123/A 123M as applicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Materials indicated on the drawings or required in the work and not covered elsewhere by detailed requirements shall conform to the requirements of this section. In all cases not specifically covered in these specifications, the Contractor shall furnish approved highest grade commercial materials or products which are suitable for the intended use of the item.

2.1.2 Structural Shapes and Plates

Steel structural shapes and plates shall conform to ASTM A 36/A 36M. Galvanized coatings where required, shall conform to ASTM A 123/A 123M.

2.1.3 Steel Pipes

Steel pipe shall conform to ASTM A 53/A 53M, Type E or S, Grade A, galvanized nominal size and weight unless noted otherwise.

2.1.4 Corrosion-Resisting Steel Bolts and Anchor Bolts

Corrosion-resisting steel bolts and anchor bolts shall conform to ASTM A 276, Class 304, Condition A, or the applicable requirements of ASTM A 320/A 320M, Grade B8.

2.1.5 Bolts

Bolts shall conform to ASME B18.2.1.

2.1.6 Nuts

Nuts shall conform to ASME B18.2.2. Nuts shall be galvanized.

2.1.7 Expansion Anchors

Expansion anchors shall conform to the applicable requirements of CID A-A-1925. Anchors shall be multiple unit with inside thread.

2.1.8 Concrete, Mortar and Grout

Concrete, mortar and grout shall conform to the requirements of Section 03307 CONCRETE FOR MINOR STRUCTURES.

PART 3 EXECUTION

3.1 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Steel with welds will not be accepted, except where welding is definitely specified or called for on the drawings. All bolts, nuts, and screws shall be tight. Work shall be accurately set to established lines and elevations and securely fastened in place. Anchorage shall be provided where necessary for fastening miscellaneous metal and wood items securely in place Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; machine and carriage bolts for steel; and lag bolts and screws for wood.

3.2 FINISHING

In general, tolerances for machine-finished surfaces designated by nondecimal dimensions shall be within 0.156 inches. Sufficient machining stock shall be allowed on placing pads to insure true surfaces of solid material. Finished contacts of bearing surfaces shall be true and exact to secure full contact. All drilled holes for bolts shall be accurately located and drilled from templates.

3.3 ZINC COATING (GALVANIZING)

Zinc coatings shall be applied in a manner and of a thickness and quality conforming to ASTM A 123/A 123M. All exposed ferrous metalwork, except

cast-iron and corrosion resistant steel and items to be completely embedded in concrete, shall be galvanized unless other protective coatings are specified. Metalwork, including completed railing assemblies, shall be galvanized after fabrication. In the event that any portion of galvanized metalwork is abraded or otherwise damaged to the extent that the base metal is exposed, such damaged or abraded portions shall be neatly covered with Grade 50B solder conforming to the requirements of ASTM B 32.

3.4 WELDING

Welding shall conform to the provisions of AWS D1.1. Welders who have not been certified within two years of the date of commencement of work under this contract will not be allowed to perform the work.

3.5 BOLTED CONNECTIONS

Bolt holes shall be reamed normal to the member and shall be truly cylindrical throughout. Unless otherwise specified, holes for bolts shall not be more than 0.0625 inches larger than the diameter of the bolt. Cutting bolt holes with a torch will not be permitted without the prior written approval of the Contracting Officer. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable.

3.6 EXCAVATION

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

3.7 ACCESS GATE

Access gates shall be installed at the locations indicated on the drawings. Access gates shall be fabricated in the shop from standard weight steel pipe conforming to ASTM A 53/A 53M. All access gate components shall be galvanized. Welded, cut, damaged, and deformed areas of galvanizing metal shall be neatly coated with Grade 50B solder conforming to ASTM B 32. The gate shall be installed in such a manner that they work freely. The Contractor shall examine the operation of all pipe gates not sooner than 30 days after installation for ease of operation. Any gates that cannot be operated by one person shall be repaired (including any required structural modifications) by the Contractor at no additional cost to the Government, and requirements for repair shall conform to the requirements for bolts for steel; and lag bolts and screws for wood.

3.8 PIPE BOLLARDS

Pipe bollards shall be fabricated with heavy duty galvanized G60 coating steel pipe conforming to ASTM A 53/A 53M, Type E or S, weight STD, black finish as indicated on the drawings. Pipe bollards shall be set vertically in concrete encasements. Concrete for encasements and pipe fill shall conform to ASTM C 94/C 94M, having a compressive strength of 3,500 psi.

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EXCAVATION

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SECTION 02200

EXCAVATION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

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

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 GENERAL

Excavation shall consist of the removal of every type of material encountered in the designated areas or from areas directed. The material to be removed may include but is not limited to hardpan, silt, sand, gravel, cobbles and boulders, cemented silt/sand/gravel/cobbles/boulders with various degrees of cementation, caliche, asphalt, vegetation, trash, and other debris. 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. Measurement for payment shall be in accordance with Section 01251 MEASUREMENT AND PAYMENT. Excavation for permanent cuts shall be made to the slope lines indicated. Excavation may require ripping or other rock-excavation techniques and shall be performed in a manner which will not impair the subgrade. Rock or cemented material from required excavation to be used in compacted fills and backfills shall be crushed or otherwise reduced in size to meet gradation requirements contained in Section 02250 FILLS AND SUBGRADE PREPARATION prior to placement or stockpiling. Except as otherwise specified, the finish surface of subgrades shall be smooth and shall not vary more than 12.5 millimeters from indicated grade. Prior to commencing excavation, the Contractor shall submit his plan for excavation to the Contracting Officer. All subgrade excavations will be inspected by the Contracting Officer prior to placement of any fill materials.

1.3 BLASTING

Blasting will not be permitted.

1.4 PRESERVATION OF PROPERTY

All excavation operations shall be conducted in such a manner that concrete structures, embankments, utilities, 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 piling, cribbing, bulkheads, shores, or whatever means may be necessary to adequately support material carrying such improvements or to support the 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 the property of the Contractor and when no longer needed shall be removed from the site. The Contractor shall submit for approval shop drawings showing proposed method of 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 pressures 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 manner as not to disturb or damage the finished concrete or other facility.

1.5 EXCAVATION ADJACENT TO 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.

1.6 EXCAVATION CHANNEL

Channel excavation consists of the removal of all materials within the lines and grades indicated.

1.7 REMOVAL OF UNSATISFACTORY SOILS

The removal of soils which are unsatisfactory for foundation of channel, or structures may be required in certain areas. Unsatisfactory materials include but are not limited to those materials containing roots and other organic matter, trash, debris and materials classified in ASTM D 2487, as Pt, OH, OL, CH, MH, and materials that are too wet to support construction equipment. The Contractor will be required to excavate any such areas to the depth directed and backfill the areas with compacted fill conforming to the requirements of the Section 02250 FILLS AND SUBGRADE PREPARATION.

1.8 EXCAVATED MATERIALS

Excavated materials suitable for required fills shall be placed in temporary stock piles or used directly in the work. The Bureau of Land Management and the Howard Hughes Corporation maintain the mineral rights to the materials on their properties. 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 the expressed authority of the Contracting Officer.

Prior to excavation, or placing excavated materials, the miscellaneous fill and any approved stockpile area(s) 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 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS. Any stockpiles shall be placed in a manner to preclude ponding of water.

1.9 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 the Section 02250 FILLS AND SUBGRADE PREPARATION, or concrete conforming to the Section 03307 CONCRETE FOR MINOR STRUCTURES. All excavating, backfilling, compacting of backfill, and concreting occasioned thereby shall be by the Contractor at no additional cost to the Government. Any overcut under channel and structures shall be backfilled with concrete.

1.10 EXCAVATION AT TURNAROUND AREA

Excavation required to complete rough grade at the turnaround area should be anticipated to be difficult. The highly cemented native material shall require hoe ramming, rock saw, or other rock removal techniques without the use of explosives.

1.11 **1.11 SOIL STABILIZER**

Finished grades in areas of cut and fill shall be treated with a soil stabilizer in accordance with Section 02250 FILLS AND SUBGRADE PREPASRATION.

PART 2 PRODUCTS (NOT APPLICABLE)

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SECTION 02250

FILLS AND SUBGRADE PREPARATION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-1bf/cu. ft. (2,700 kN-m/cu. m.))
ASTM D 2216	(1998) Laboratory Determination of Water (Moisture) Content of Soil and Rock
ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-09, Reports

Testing of Compacted Fill Materials; GA.

Field Density Tests; GA.

Copies of all laboratory and field test reports within 24 hours of the completion of the tests.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 COMPACTION EQUIPMENT

Compaction shall be accomplished by tamping roller, rubber tired roller vibratory compactor or mechanical tampers. All equipment, tools, and machines shall be maintained in satisfactory working condition at all times. Compaction equipment shall be suitable for consistently producing uniform soil densities.

3.2 GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS

3.2.1 Control

Moisture-density relations shall be established by the Contractor. The soil used for each maximum density test shall be classified in accordance with ASTM D 2487 and shall include a particle size analysis in accordance with ASTM D 422. At least one five point maximum density test shall be made for every 10 field density tests. Field density tests shall be performed by the Contractor at the frequency established in paragraph: 1.4.1.2 Field Control, 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.

3.2.2 Laboratory Control

Moisture-density relations shall be established by the Contractor. One moisture-density relation shall be made for each classification, blend or change in classification of soil materials 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.

a. 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.

3.2.3 Field Control

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. Determination of in-place densities using the nuclear method ASTM D 2922 may be used to supplement the sand cone density tests ASTM D 1556. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. At least one adjacent sand cone test shall be performed for every five nuclear density tests performed. If field density tests determined by the nuclear method vary by more than 0.5 kilonewtons per cubic meter from comparison

sand-cone tests, and are consistently high or low, adjustment of the calibration curve is necessary.

a. In-Place Densities

(1) A minimum of one test per 500 cubic meters of fill or backfill for areas compacted by other than hand-operated machines. At least one test shall be made in each 0.6 meter layer of compacted fill or backfill processed as a unit and not less than one test shall be made in each area.

(2) One test per 200 cubic meters, or fraction thereof, shall be made of each lift of fill or backfill areas compacted by hand-operated machines.

The Contractor CQC shall maintain a log of all tests which will be updated and submitted to the Contracting Officer on a weekly basis. The test log shall include: Test number (if retest shall include retest number), date, feature of work, station and offset, weight of wet soil, weight of dry soil, percent of compaction, optimum moisture content, maximum dry unit weight, soil classification, in-place density test methods either sand-cone or nuclear densimeter.

Settling of fills or backfills with water will not be permitted.

3.2.4 Fill Material

Fill material shall be obtained from the required excavation or borrow area shown on the plans. Materials considered unsatisfactory for use as compacted fill include but are not limited to those materials containing roots and other organic matter, trash, and debris. Chunks or clumps of cemented material shall be crushed and processed to contain no stone whose greatest dimension is more than 3/4 the lift thickness. Larger size stone, crushed materials, and concentrated chunks, shall be mixed with a binder for compaction. The Contractor shall expect to break-down, crush or otherwise process required excavation for use as fill material due to the cementation of in-situ soils. Materials classified in ASTM D 2487 as MH, CH, Pt, OH, and OL are also considered unsatisfactory for use as compacted fill. Material for compacted fill behind concrete structures shall contain less than 30 percent by weight passing the No. 200 sieve and shall contain no stone larger than 75 mm.

3.2.5 Placement

Fill material shall not be placed against concrete which has not been in place at least 14 days or until the concrete has attained a strength of 17.2 megapascals when tested in accordance with Section 03307 CONCRETE FOR MINOR STRUCTURES. Placement over pipes and buried structures shall be in accordance with Section 02400 REINFORCED CONCRETE PIPE. Compacted fill shall be placed with suitable equipment in horizontal layers which before compaction, shall not exceed 300 mm in depth for rubber-tired or vibratory rollers, 200 mm in depth for tamping rollers, and 100 mm 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. All fill areas not receiving additional treatment, such as concrete or aggregate base course, shall be final graded to the lines and grades shown on the drawings with a completed tolerance of +/- 25 mm in 3.65 meters.

3.2.6 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 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 2 percent above optimum and a minimum moisture content of not less than 2 percent below optimum.

3.2.7 Compaction

No layer of fill shall be compacted before the practicable uniform moisture content has been obtained. Scarified areas shall be compacted as specified for the fill placed thereon. Rollers will not be permitted to operate within 0.3 meters of structure walls or over buried structures until the compacted fill over the top of the structures has reached a depth of 600 mm. 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.

3.3 COMPACTED FILL

3.3.1 Preparation for Placing

Before placing material for compacted fill, the foundation surface shall be cleared of all existing obstructions, vegetation and debris. Unsatisfactory or unstable (too wet) material not meeting the requirements for fill material shall be removed where directed. The existing surfaces for the compacted fill shall be proofrolled by four passes of the compaction equipment and scarified to a depth of 150 millimeters. Sloped ground surfaces steeper than one vertical to 4 horizontal, on which fill or compacted fill is to be placed, shall be stepped in such a manner that the equipment will bear on the full depth of the fill layer.

3.3.2 Compacted Fill, Pipe

3.3.2.1 Compaction

Compacted fill includes fill under and adjacent to the channel and under the maintenance road more than 300 mm beneath the road base course. Compacted Fill, Pipe includes fill more than 610 mm above the top of pipe. Each layer of the material shall be compacted to not less than 90 percent of maximum density, per ASTM D 1557.

3.3.2.2 Trimming

The side slopes of the channel shall be trimmed to the lines indicated on the drawings with a tolerance of plus or minus 25 millimeters. Any material loosened by trimming shall be recompacted and the area moistened and compacted with one pass of a smooth-wheeled roller. Tolerances shall apply after rolling. Fill slopes shall be trimmed to a uniform alinement at top of berm and reasonably uniform slope at, or outside, the lines shown on the drawings.

3.3.3 Compacted Fill, Road

3.3.3.1 Location

Compacted fill, road shall consist of fill placed for the channel maintenance road, in the upper 300 millimeters beneath the road, and of fill placed for the access roadways.

3.3.3.2 Compaction

Fill shall be compacted to not less than 95 percent of maximum density per ASTM D 1557.

3.4 BACKFILL

3.4.1 About Structures

3.4.1.1 Location

Backfill about structures shall consist of all fill against and/or around structures, except backfill for pipes and compacted fill.

3.4.1.2 Material

Backfill material shall be obtained from the required excavation as approved by the Contracting Officer. In general, the best material available will be designated as backfill and fill about structures. Backfill may consist of sand, gravelly sand, and silty sands. Organic material, silt, clay, broken concrete or pavement, boulders and other unsatisfactory material shall not be used. Backfill for structures shall not contain any stones larger than 75 millimeters.

3.4.1.3 Placing

Backfill material shall not be placed against concrete which has not been in place at least 14 days or until the concrete has attained a strength of 17.2 megapascals when tested in accordance with Section 03307 CONCRETE FOR MINOR STRUCTURES. Backfill shall be placed in 100 millimeter layers.

3.4.1.4 Compaction

Compaction shall be not less than 90 percent of maximum density, per ASTM D

1557.

3.4.2 Initial Backfill

3.4.2.1 Location

Initial backfill shall consist of all fill placed in pipe trench above the bedding and up to a minimum of 610 millimeters above the top of the pipe. The pipe bedding is specified in Section 02400, REINFORCED CONCRETE PIPE, and extends from the bottom of the trench to the springline of the pipe.

3.4.2.2 Material

Material shall conform to the requirement in paragraph: BACKFILL ABOUT STRUCTURES except that the material placed above the springline of the pipe, and until the pipe has a cover of 610 millimeters, shall contain not less than 95 percent by weight passing the 25 millimeters sieve, and shall contain no stone larger than 76 millimeters.

3.4.2.3 Compaction

Compaction shall not be less than 90 percent of maximum density, per ASTM D 1557.

3.5 MISCELLANEOUS FILL

Miscellaneous fill shall consist of material from the required excavation, placed in the areas indicated and shall be placed with suitable equipment in layers which shall not exceed 600 millimeters in depth before consolidation. Broken concrete, rock, cemented alluvium, and asphalt to be wasted may be buried in the miscellaneous fill provided such material does not exceed 600 millimeters in its greatest dimension, is placed in a manner that will prevent the formation of voids, and is placed not less than 600 millimeters below finished grade (including finished grade of side slopes). No depressions in which water might pond shall be left in miscellaneous fill area. The finished areas shall be sloped to drain. Compaction other than that obtained by the controlled movement of the construction equipment will not be required.

3.6 SUBGRADE PREPARATION

Subgrade preparation shall include subgrade preparation for channel slopes and inverts, areas to receive compacted fill, aggregate base course, and junction structures. All trash and debris shall be removed in accordance with Section 02150 CLEAR SITE AND REMOVE OBSTRUCTIONS and Section 02200: EXCAVATION.

3.6.1 Channel Subgrade Preparation

After the channel has been excavated to rough grade, the entire subgrade for the channel slopes and invert shall be moisture conditioned and proofrolled by 4 passes of the compaction equipment and trimmed to a uniform grade and smoothed with a steel-wheeled roller to make the subgrade ready to receive filter material and riprap stone. If the subgrade is

disturbed by the Contractor's operations or is overexcavated, or is soft or yielding, the subgrade shall be restored to grade and compacted to a density of 95 percent of maximum density, per ASTM D 1557. The finished surface of the subgrade shall not be more than 25 millimeters from the indicated grade at any point when tested with a 3.1 meter straightedge.

3.6.2 Compacted Fill and Aggregate Base Course Subgrade Preparation

The subgrade shall be alternately watered or dried back, and scarified until the material is uniformly moistened throughout for a depth of not less than 150 millimeters to near optimum. All stones larger than 100 millimeters in diameter, and hard ribs of earth shall be removed. The amount of water that is applied shall be that which is required to provide optimum results in compaction under rolling. Following the above operations, the roadbed 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 complete, the surface shall be firm, hard, 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 not be more than 6 millimeters below or above true subgrade.

3.7 SOIL STABILIZER

This work shall consist of application of a dust control soil stabilizer to ground surfaces as directed by the Contracting Officer. The work shall include furnishing and applying the stabilizer to the finished grade surfaces that have been disturbed by construction including all exposed excavation and fill surfaces, and haul roads.

The soil stabilizer shall be a mixture of plaster and natural cellulose fiber mulch. The cellulose fiber mulch shall be produced from grinding clean, whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7 percent. The plaster shall consist of natural occurring high purity processed gypsum and additives. The gypsum shall be produced from a mined or quarried source. The gypsum shall be processed to be composed of a crushed, dry calcium sulfate hemihydrate having a purity of not less than 88 percent. The soil stabilizer shall be mixed with color pigments to match existing soil color on site. Color can be matched by using the "Davis Colors" chart by Soil-Tech, Las Vegas, Nevada or equal. The gypsum and additives shall be furnished either in bags or bulk and be accompanied by bills of lading and shipping invoices. The shipping invoices for the gypsum shall state the gypsum's purity content, dry weight, and source of manufacture. Processed gypsum which has become partially air set, lumpy or caked shall not be used. The plaster/cellulose fiber mulch shall be applied at a rate of of plaster mixed with of fiber per acre. The plaster/cellulose fiber mulch stabilizer shall formulate a protective crust-like barrier within 4 to 8 hours after application. Application of the plaster/cellulose fiber mulch stabilizer will not be permitted when weather conditions are unsuitable for concrete placement in accordance with Section 03307 CONCRETE FOR MINOR STRUCTURES.

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DIVISION 02 - SITE WORK

SECTION 02900

LANDSCAPE CONTRACTOR PREQUALIFICATION

-- End of Section Table of Contents --

SECTION 02900

LANDSCAPE CONTRACTOR PREQUALIFICATION

PART 1 GENERAL

1.1 APPLICATION SUBMITTAL

The Contractor or Subcontractor responsible for plant salvalge application of desert varnish and seeding work shall submit with the bid a completed application form demonstrating experience in this type of work. The application form is included at the end of this section.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

LANDSCAPE CONTRACTOR APPLICATION FOR QUALIFICATION

In accordance with the requirements of the Contract Documents for the Red Rock Outlet Channel the undersigned offers the following information as evidence of his/her qualifications to perform the seeding, native plant extraction, salvage, transport, application of simulated desert varnish and associated landscaping work to be bid upon, according to all the requirements of the plans and specifications for said project.

1. Name of Contractor_____

   Business Address_____

   _____
   City, State and Zip Code

2. Social Security Number or
   Federal Identification Number_____

3. Telephone No._____ 4. Fax No._____

4. List a minimum of 3 projects you have completed where you were solely responsible for the successful seeding and extraction, salvage, transport of native plant materials in a desert environment. List three projects completed where you were solely responsible for the application of desert varnish.

PROJECT:_____
LOCATION:_____
WORK DESCRIPTION:_____
_____
_____
_____
OWNER/REFERENCE:_____TEL. No._____
ARCHITECT/ENGINEER:_____TEL. NO._____
CONTRACT AMOUNT:_____COMPETION DATE_____

PROJECT:_____
LOCATION:_____
WORK DESCRIPTION:_____
_____
_____
PLANT MATERIALS INVOLVED:_____
_____
OWNER/REFERENCE:_____TEL. No._____
ARCHITECT/ENGINEER:_____TEL. NO._____
CONTRACT AMOUNT:_____COMPETION DATE_____

PROJECT:_____
LOCATION:_____
WORK DESCRIPTION:_____
_____

PLANT MATERIALS INVOLVED:_____

OWNER/REFERENCE:_____TEL. No._____
ARCHITECT/ENGINEER:_____TEL. NO._____
CONTRACT AMOUNT:_____COMPETION DATE_____

PROJECT:_____
LOCATION:_____
WORK DESCRIPTION:_____

PLANT MATERIALS INVOLVED:_____

OWNER/REFERENCE:_____TEL. No._____
ARCHITECT/ENGINEER:_____TEL. NO._____
CONTRACT AMOUNT:_____COMPETION DATE_____

PROJECT:_____
LOCATION:_____
WORK DESCRIPTION:_____

PLANT MATERIALS INVOLVED:_____

OWNER/REFERENCE:_____TEL. No._____
ARCHITECT/ENGINEER:_____TEL. NO._____
CONTRACT AMOUNT:_____COMPETION DATE_____

5. List native desert plant materials that you have experience in extracting and salvaging. _____

6. The Contractor may provide additional information such as resumes of principals or key personnel, letters of recommendation, past project monitoring reports showing successful results, project photographs, or any other information demonstrative of the Contractor's experience, skill, ability and integrity. Attach to this application.

7. The Contracting Officer reserves the right to request at any time additional information regarding the Contractor's experience, equipment, references, completed projects, work currently under contract, and any and all information pertinent to the Contractor's skill, ability and integrity to perform the required work.

The undersigned, on behalf of the Contractor, hereby certifies the foregoing information to be true and complete. The undersigned further certifies that he or she is authorized to sign this application on behalf of the Contractor.

Company Name (Print or Type)

By:_____Date_____
Signature and Title

_____
Print Name and Title

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DIVISION 02 - SITE WORK

SECTION 02910

NATIVE PLANT EXTRACTION AND SALVAGE

-- End of Section Table of Contents --

SECTION 02910

NATIVE PLANT EXTRACTION AND SALVAGE

PART 1 GENERAL

The Contractor shall furnish qualified personnel, equipment, labor, and materials, and perform all work for native plant material extraction and salvage as specified herein, shown on the Contract Drawings, and as directed by the Contracting Officer.

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

1.2 INSPECTION

The extracted and salvaged yucca plants shall be inspected for plant condition and damage prior to being taken to the Desert Tortoise Center. Plant materials that have been exposed to heat, excessive root drying, and damaged or mutilated stock shall be rejected and the Contractor will be charged for replacement fees at fair market value. All plants shall be inspected to insure that the north orientation is clearly marked on each plant in such a manner that the marking will be protected during transport and storage.

1.3 REPLACEMENT OF DAMAGED, DEAD, VANDALIZED OR MISSING PLANT MATERIAL

The Contractor shall replace any damaged, dead, vandalized or missing plant materials at no additional cost. Replacement plants shall be of the same species, and size as original stock, and shall be subject to inspection and approval by the BLM.

PART 2 PRODUCTS

2.1 NATIVE PLANT MATERIALS

2.1.1 Yucca

The Mohave yucca plants shall be extracted, and salvaged from all areas within the construction disturbance zone as shown on the Contract Drawings and as directed by the Contracting Officer.

PART 3 EXECUTION

3.1 EXTRACTION OF NATIVE PLANT MATERIALS

3.1.1 Extraction Time

Native plant materials shall be extracted and salvaged from January 1 to May 15 for spring work; and from September 15 to December 15 for fall work.

3.1.2 Salvage Conditions

Salvage operations shall be performed only during periods when beneficial results can be obtained. When drought, high temperatures, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the extraction and salvage operations, the Contractor shall propose alternate times for approval by the Contracting officer.

3.1.3 Plant Orientation

The north orientation of each individual yucca plant shall be marked prior to extraction from the growing site. The marking must be clearly visible and must stay on the plant throughout the extraction, salvage and transport. If necessary a compass shall be used to determine the north orientation at the time of marking. Marking shall not result in any damage to the plant such as cuts, bruises, stem breakage, or insertion of any foreign objects into plant tissues.

3.1.4 Yucca Extraction and Salvage

Clonal yucca plants may be salvaged as a clump or as individual plants. If salvaged individually each plant must have the north orientation marked prior to extraction from the growing site. If salvaged as a clump each stem also must be marked to provide for the situation that a stem may become detached from the clump during extraction, salvage or transport.

3.2 CLEAN UP

3.2.1 Clean Up

Excess plant materials and other organic waste material generated from the plant extraction and salvage operation or clearing activities shall be disposed of off-site in a landfill or buried on-site in a location approved by the Contracting Officer. Inorganic waste materials must be hauled off-site to a landfill.

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02921

SEEDING

-- End of Section Table of Contents --

SECTION 02921

SEEDING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01	(Aug 95) Federal Seed Act Regulations Part 201

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

1.2 PROFESSIONAL OVERSIGHT

The CONTRACTOR shall provide a landscape professional with previous drill seeding and hydroseeding experience to oversee the seeding operations for the duration of this work type. To be considered qualified, the professional's experience must include at least 3 projects involving the drill seeding and hydroseeding. See the landscape Contractor's qualification sheet in the bid documents. The Contractor shall use the landscape subcontractor they were successful low bidder with. No substitutions shall be allowed.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Equipment; FIO. Chemical Treatment Material; GA.

Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

SD-07 Schedules

Equipment; FIO

A listing of equipment to be used for the seeding operation.

SD-08 Statements

Finished Grade and Topsoil; GA.

Finished grade status.

Availability of topsoil from the stripping and stock piling operation.

SD-09 Reports

Soil Sample Fertility Analyses; GA
Equipment Calibration; GA.

Certification of calibration tests conducted on the equipment used in the seeding operation.

SD-13 Certificates

Seed; GA. Fertilizer; GA. Pesticide; GA.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

b. Fertilizer. Chemical analysis and composition percent.

c. Pesticide. EPA registration number and registered uses.

SD-18 Records

Seed Establishment Period; GA.

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record; GA.

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

Application of Pesticide;GA.

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material,

application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Pesticides

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

1.4.2 Storage

Materials shall be stored in designated areas. Seed, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.4.3 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.4 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS-01 and applicable state seed laws.

2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be proportioned by weight as follows:

Scientific Name	Common Name	Kilograms per Hectare	% of Mixture By Weight

Hilaria rigida	Galleta grass	4	16
Oryzopsis hymenoides	Indian ricegrass	4.6	16
Sphaeralcea ambigua	Desert globemallow	1.7	6
Encelia virginensis	Virgin Mountains encelia	1.7	6
Baileya multiradiata	Desert Marigold	1.7	6
Eriogonum inflatum	Desert trumpet	1.7	6
Ambrosia dumosa	White bursage	4.2	14
Larrea tridentata	Creosote bush	2.5	8
Ephedra nevadensis	Nevada ephedra	3.5	12
Atriplex canescens	Four-wing saltbush	2.8	10
Total Application Rate		**29**	**100**
		kilograms/hectare	

2.1.3 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.4 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed.

2.1.5 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

The topsoil shall be the existing surface soil stripped and stockpiled onsite as directed by the Contracting Officer. Topsoil shall be free from slag, cinders, lumps of soil, sticks, roots, trash or other material over a minimum 40 mm diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of fertilizer meeting the following requirements.

2.3.1 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.1.1 Nitrogen Carrier Fertilizer

It shall be as recommended by the soil test. Nitrogen carrier fertilizer shall be commercial grade, free flowing, and uniform in composition. The fertilizer may be a liquid nitrogen solution.

2.3.1.2 Super Absorbent Polymers

To improve water retention in soils, super absorbent polymers shall be sized and applied according to the manufacturer's recommendations. Polymers shall be added as a soil amendment and be cross-linked polyacrylamide, with an absorption capacity of 250-400 times its weight. Polymers shall also be added to the seed and be a starch grafted polyacrylonitrite, with graphite added as a tacky sticker. It shall have an absorption capacity of 100 plus times its weight.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region. Mulch shall be placed on treatments A and C.

2.4.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.4.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.4.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.5 WATER

Water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

2.6 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification, a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed from March 1 to April 15 for spring establishment; and from September 1 to October 15 for fall establishment.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the seeding operation.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying Fertilizer

The fertilizer shall be applied as recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 100 mm depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.2 Applying Super Absorbent Polymers

Polymers shall be spread uniformly over the soil as recommended by the manufacturer and thoroughly incorporated by tillage into the soil to a maximum 100 mm depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 100 mm depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 50 mm depth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The fertilizer may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 25 mm below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Protection

Areas with the prepared surface shall be protected from compaction or

damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

Seeding method shall be Drill Seeding or Hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer.

3.3.1.1 Drill Seeding

Seed shall be uniformly drilled to a maximum 13 mm depth and at the rate of 29 kilograms per hectare, using equipment having drills a maximum 175 mm distance apart. Row markers shall be used with the drill seeder. Half the total rate of seed application shall be drilled in 1 direction, with the remainder of the seed rate drilled at 90 degrees from the first direction. The drilling equipment shall be maintained with half full seed boxes during the seeding operations. Drill seeding shall be used on all areas flatter than 10H:1V.

3.3.1.2 Rolling

The entire area shall be firmed with a roller not exceeding 130 kilograms per meter roller width. Slopes over a maximum 3-horizontal-to-1 vertical shall not be rolled. Areas seeded with seed drills equipped with rollers shall not be rolled.

3.3.2 Hydroseeding

Seed shall be mixed to ensure broadcast at the rate of 29 kilograms per hectare. Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Wood cellulose fiber mulch and tackifier shall be added at the rates recommended by the manufacturer after the seed, fertilizer, and water have been thoroughly mixed to produce a homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled. Hydroseeding shall be used on slopes steeper than 10H:1V.

3.3.3 Mulching

3.3.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 0.75 metric tons per hectare. Mulch shall be spread by hand, blower-type mulch

spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.3.3 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.3.4 Wood Cellulose Fiber, Paper Fiber, and Recycled Paper

Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.3.4 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied once every other week during the hottest summer months and once per month during the remainder of the first year or as directed by the Contracting Officer. Run-off and puddling shall be prevented. Watering trucks shall not be driven over seeded areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.4 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.5 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the pest management program.

3.5.1 Technical Representative

The certified installation pest management coordinator shall be the

technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.5.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately. A pesticide plan shall be submitted.

3.6 RESTORATION AND CLEAN UP

3.6.1 Restoration

Seeded areas, plant materials, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.6.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.7 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.8 SEED ESTABLISHMENT PERIOD

3.8.1 Commencement

The seed establishment period to obtain a healthy stand of plants shall begin after the last day of the seeding operation and shall end 6 months later. Written calendar time period shall be furnished for the seed establishment period. The seed establishment period shall be coordinated with 02930 EXTERIOR PLANTING. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.8.2 Satisfactory Stand of Plants

Shrubs shall be evaluated for species and health when the plants are 15 to 30 cm high. Grass shall be evaluated for health at a height of 80 mm.

3.8.2.1 Slopes and Field Areas

A satisfactory stand of plants from the seeding operation for slopes and field area shall be a minimum 100 plants per square meter. The total bare spots shall not exceed 2 percent of the total seeded area.

3.8.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include eradicating weeds, insects and diseases; protecting slopes from surface erosion; maintaining mulch; protecting installed areas from traffic; watering; and post-fertilization.

3.8.3.1 Post-Fertilization

The fertilizer shall be applied as recommended by the soil test. A maximum 4 kilograms per hectare of actual available nitrogen shall be provided to the plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed grass plants.

3.8.3.2 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.8.3.3 Repair or Reinstall

Unsatisfactory stand of plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.8.3.4 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of plants.

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02950

SIMULATED DESERT VARNISH ROCK COLOR MITIGATION

-- End of Section Table of Contents --

SECTION 02950

SIMULATED DESERT VARNISH ROCK COLOR MITIGATION

PART 1 GENERAL REQUIREMENTS

The Contractor shall furnish qualified personnel, equipment, labor, and materials, and perform all work for applying desert varnish in the locations shown on the Contract Drawings, and as directed by the Contracting Officer.

1.1 Submittals

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Equipment; FIO.
A listing of equipment to be used for the application of simulated desert varnish.

Simulated Desert Varnish; GA
Manufacturers printed information for simulated desert varnish to be used to stain riprap, rock, and road surfaces.

PART 2 PRODUCTS

2.1 Simulated Desert Varnish Rock Color Mitigation

The coloring material shall be a single step, simulated desert varnish that will impart or restore natural patinas to the designated areas in an environmentally friendly way without the use of caustic or acidic materials. The material shall produce stable, oxidized colors with a projected life of 100 years. The rock coloring material shall be PERMEON or an approved equal. PERMEON is available from the following manufacturer or manufacturer's licensees.

Manufactured by:

Advanced Concrete Technologies
11622 Newport Avenue
Santa Anna, CA 92705
(714) 731-0906

Authorized Permeon Applicators:

Soil-Tech

5375 Cameron drive
Las Vegas, NV 89118
(702) 873-7585

Desert Rock Supply
P.O. Box 924
La Quinta, CA 92253
(760) 360-1354

Arizona Rain Sprinkling
129 West Elwood
Phoenix, AZ 85041
(602) 268-8100

PART 3 EXECUTION

3.1 General

The rock coloring material shall be applied only by licensed applicators or by applicators approved by the manufacturer. Variegated patinas that develop shall be controlled by custom blending of the rock coloring material and/or application techniques. The rock coloring material shall be clear when applied and full color development shall occur within two to four weeks.

3.2 Surface Preparation

The rock coloring material shall be applied directly to clean rock surface. There shall be no dust or soil on the rock surface at the time of the application. The conditions of the rock shall be inspected and approved by the Contracting Officer prior to application of the simulated desert varnish.

3.3 Sample Area

The Contractor shall apply the rock coloring to a test section to be reviewed by the Contracting Officer. Upon approval of the test section(s) and application procedures, by the Contracting Officer, the Contractor may proceed.

3.4 Application of Simulated Desert Varnish

The riprap material and road surfaces to be treated shall be uniformly stained to blend with the surrounding colors in the environment. The Contracting Officer shall approve the stain coverage of all treated areas.

-- End of Section --