

SPECIFICATIONS

for

**SKUNK CREEK CHANNEL  
AND LEVEES**

and

**OVERLOOK (JOMAX) ROAD  
WIDENING**

**Maricopa County, Arizona**

Gila River Basin

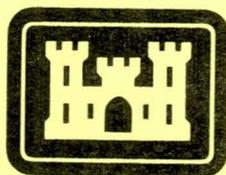
New River and Pheonix City Streams

Appropriation: 96x3122 Construction General  
Corps of Engineers,Civil

96x8862 Contributed Funds, Required

Authority: Appropriation Bill for FY82

Property of  
Flood Control District of MC Library  
Please Return to  
2001 W. Durango  
Phoenix, AZ 85009



**US Army Corps  
of Engineers**

Los Angeles District

A400.501

**INVITATION FOR BIDS  
(CONSTRUCTION CONTRACT)**

NAME AND LOCATION OF PROJECT

SKUNK CREEK CHANNEL AND LEVEES  
AND OVERLOOK (JOMAX) ROAD  
WIDENING AT MARICOPA COUNTY,  
ARIZONA

DEPARTMENT OR AGENCY

DEPARTMENT OF THE ARMY

BY (Issuing office)

U. S. ARMY ENGINEER DISTRICT, LOS ANGELES  
P.O. BOX 2711, LOS ANGELES, CALIFORNIA 90053

Sealed bids in duplicate for the work described herein will be received until 1 p.m. local time at the place of bid opening, 21 January 1982

at Room 1030 (South Tower) 2721 North Central Avenue, Phoenix, Arizona 85004

and at that time publicly opened.

Information regarding bidding material, bid guarantee, and bonds

**BID BONDS.** Each bidder shall submit with his bid a Bid Bond (Standard Form 24) with good and sufficient surety or sureties acceptable to the Government, or other security as provided in paragraph 4 of Instructions to Bidders (Standard Form 22) in the form of 20% of the bid price or \$3,000,000, whichever is lesser. The bid bond penalty may be expressed in terms of a percentage of the bid price or may be expressed in dollars and cents.

**PERFORMANCE AND PAYMENT BONDS.** Within <sup>5</sup> days after the prescribed forms are presented to the bidder to whom award is made for signature, a written contract on the form prescribed by the specifications shall be executed and two bonds, each with good and sufficient surety or sureties acceptable to the Government, furnished; namely a performance bond (Standard Form 25) and a payment bond (Standard Form 25-A). The penal sums of such bonds will be as follows:

(a) Performance Bond. The penal sum of the performance bond shall equal 100% of the contract price.

(b) Payment Bond.

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

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

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

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

NOTE: For bids less than \$25,000, bid bonds, performance and payment bonds will not be required.

Description of work

The work consists of construction of approximately 3 miles of concrete bridge modifications, asphalt concrete pavement, chain-link and barbed wire fencing, guardrails, seeding and appurtenant work.

THE ESTIMATED COST OF CONSTRUCTION IS BETWEEN \$1,000,000 AND \$5,000,000.

This is a Civil Works procurement and is not funded by the Department of Defense.

8/25/77

**READ THE FOLLOWING IN CONJUNCTION WITH INSTRUCTIONS TO BIDDERS (U. S. STANDARD FORM 22).**

1. **PLANT AND EQUIPMENT.** Each bidder shall, upon request of the Contracting Officer, furnish a list of the plant available to the bidder and proposed for use on the work.
2. **MODIFICATIONS PRIOR TO DATE SET FOR OPENING BIDS.** The right is reserved, as the interest of the Government may require, to revise or amend the specifications or drawings, or both prior to the date set for opening bids. Such revisions and amendments, if any, will be announced by an amendment or amendments to this Invitation for Bids. If the revisions and amendments are of a nature which requires material changes in quantities or prices bid or both, the date set for opening bids may be postponed by such number of days as in the opinion of the District Engineer will enable bidders to revise their bids. In such cases, the amendment will include an announcement of the new date for opening bids.
3. **BIDDERS** are required to acknowledge receipt of all amendments to this Invitation on the Bid Form (Standard Form 21) in the space provided, or by separate letter or telegram prior to opening of Bids. Failure to acknowledge all amendments may cause the rejection of the bid.
4. **NOTICE REGARDING BUY AMERICAN ACT (1970 SEP).** The Buy American Act (41 U.S.C. 10a-10d) generally requires that only domestic construction material be used in the performance of this contract. Exception from the Buy American Act shall be permitted only in the case of nonavailability of domestic construction materials. A bid or proposal offering nondomestic construction material will not be accepted unless specifically approved by the Government. When a bidder or offeror proposes to furnish nondomestic construction material, his bid or proposal must set forth an itemization of the quantity, unit price, and intended use of each item of such nondomestic construction material. When offering nondomestic construction material pursuant to this paragraph, bids or proposals may also offer, at stated prices, any available comparable domestic construction material, so as to avoid the possibility that failure of a nondomestic construction material to be acceptable under this paragraph will cause rejection of the entire bid.

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

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

Commanding Officer  
U.S. Naval Publications and Forms Center  
5801 Tabor Avenue - Philadelphia, Pa. 19120

The Acquisition Management Systems and Data Requirements Control List, DoD Directive 5000.19-L, Volume II, may be ordered on the DD Form 1425. The Department of Defense Index of Specifications and Standards (DODISS) may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402. When requesting a specification or standard, the request shall indicate the title, number, date and any applicable amendment thereto by number and date. When requesting a data item description, the request shall cite the applicable data item number set forth in the solicitation. When DD Form 1425 is not available, the request may be submitted in letter form, giving the same information as listed above, and the solicitation or contract number involved. Such requests may also be made to the activity by Telex No. 834295, Western Union No. 710-670-1685, or telephone (area code 215-697-3321) in case of urgency.

5.2 **Commercial Specifications, Standards and Descriptions.** These specifications, standards and descriptions are not available from Government sources. They may be obtained from the publishers.

6. **AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS, STANDARDS, DRAWINGS, AND OTHER PERTINENT DOCUMENTS.** The specifications, standards, drawings, and other pertinent documents cited in this solicitation may be examined at the following location:

U.S. Army Engineer District, Los Angeles  
300 No. Los Angeles Street  
Los Angeles, California 90053

7. In addition to the immediate site of construction, the Department of Labor has stated that the Davis-Bacon Act applies to Contractor's operations connected with temporary facilities located off the immediate site of construction such as batch plants, sand pits, rock quarries and similar operations which have been set up exclusively to furnish materials for the contract. Therefore, employees related to these temporary facilities are considered on-site employees, and the Contractor shall maintain complete records as set out in the Labor Standards Provisions of the contract.

8. The Government further reserves the right to make award of any or all schedules of any bid, unless the bidder qualifies such bid by specific limitation; also to make award to the bidder whose aggregate bid on any combination of bid schedules is low. For the purpose of this Invitation for Bids, the word "item" as used in paragraph 10(c) of Standard Form 22, shall be considered to mean "schedule."

10/11/65

3/22/65

1/13/65

12/17/70

8/25/77

4/15/71

Read the following in conjunction with instructions to bidders (U.S. Standard Form 22.)

9. DRAWINGS. Sets of drawings, (half-size,) and of specifications will be furnished upon receipt of payment of \$5.10 per set. If individual plan sheets are requested, they will be furnished at the rate of \$0.10 for half size, for each sheet requested, but with a minimum charge of \$1.00. The maximum charge shall not exceed the charge for a full set of plans. No refund of the payment for drawings will be made and the drawings need not be returned to the District Commander. Additional copies of the specifications alone will be furnished an applicant at the rate of \$1.00 per copy. Payments will be made by cash, check or money order and delivered to the U.S. Army Engineer District, Los Angeles, 300 North Los Angeles Street, Los Angeles, California. Checks and money should be made payable to "FAO, US Army, Los Angeles District".

10. HAND CARRIED BIDS. Hand carried bids shall be deposited in Room 1030 (South Tower), 2721 North Central Avenue, Phoenix, Arizona prior to the time and date set for opening of bids or bids may be delivered to Room 1030 immediately prior to bid opening time.

11. TELEGRAPHIC MODIFICATIONS TO BIDS should be addressed to:

U.S. Army Engineer District, Los Angeles  
Resident Office  
2721 North Central Avenue  
Phoenix, Arizona 85004

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

13. NOTE THE CERTIFICATION OF NONSEGREGATED FACILITIES IN THIS SOLICITATION. Bidders or offerors and applicants are cautioned to note the "Certification of Non-Segregated Facilities" in the solicitation. Failure of a bidder or offeror to agree to the certification will render his bid or offer nonresponsive to the terms of solicitation involving awards of contracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause. (1975 OCT)

14. ADDITIONAL INFORMATION pertaining to these plans and specifications may be obtained by writing or calling (collect calls not accepted) U.S. Army Engineer District, Los Angeles, Attn: Mr. George E. Davis, P.O. Box 2711, Los Angeles, California 90053. Telephone 213 688-5493.

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

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

15.2 Definition. A "Small Business Concern" is a concern including its affiliates, which is independently owned and operated, is not dominant in the field of operation in which it is offering on Government contracts, and can further qualify under the criteria set forth in regulations of the Small Business Administration (Code of Federal Regulations, Title 13, Section 121.3-8). For the purpose of this Invitation for Bids, in order to qualify as a "Small Business Concern" the average annual receipts of the concern and its affiliates for its preceding three fiscal years must not exceed \$12,000,000, except that if the concern has 50 percent or more of its annual sales or receipts attributable to business activity within Alaska, such average annual receipts must not exceed \$15,000,000.

16. ARITHMETIC DISCREPANCIES.

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

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

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

(b) For the purposes 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, extensions, and totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

17. SITE INSPECTION. Arrangements for visiting the site may be made by contacting Mr. Terry Buckley by telephone (602) 582-8400.

18. MINIMUM ACCEPTANCE PERIOD (1975 MAR). Bids allowing less than the number of calendar days specified in the "Bid" portion of SF 19 (or on the reverse of SF 21 as applicable) for acceptance by the Government will be rejected as nonresponsive.

19. SMALL AND SMALL DISADVANTAGED BUSINESS CONCERN SUBCONTRACTING. Bidders are cautioned that compliance with General Provision: UTILIZATION OF SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS CONCERNS requires direct and specific solicitation of small business and small disadvantaged business in the preparation of the bid for any subcontract or supplies when time or other circumstances would not permit such solicitation after award. In order to assist prime contractors in developing a source list of these business concerns, you are encouraged to contact minority Contractor associations, the Minority Business Development Agency or its appropriate business development center, and/or the Small Business Administration, addresses of which may be obtained from:

Write:

U. S. Army Engineer District, Los Angeles  
ATTN: SPLDE-B  
300 North Los Angeles Street, P.O. Box 2711  
Los Angeles, CA 90053

Telephone:

Mr. Aubrey E. Simons  
Small and Disadvantaged Business  
Utilization Specialist  
Area Code (213) 688-5676

19. PRE-AWARD ON SITE EQUAL OPPORTUNITY COMPLIANCE REVIEW (1970 AUG). In accordance with regulations of the Office of Federal Contract Compliance, 41 CFR 60.1, effective 1 July 1968, an award in the amount of \$1,000,000 or more will not be made under this solicitation unless the bidder and each of his known first-tier subcontractors (to whom he intends to award a subcontract of \$1,000,000 or more) are found, on the basis of a compliance review, to be able to comply with the provisions of the Equal Opportunity clause of this solicitation.

\* \* \* \* \*

## INSTRUCTIONS TO BIDDERS

(CONSTRUCTION CONTRACT)

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

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

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

4. **Bid Guarantee.** Where a bid guarantee is required by the invitation for bids, failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

A bid guarantee shall be in the form of a firm commitment, such as a bid bond, postal money order, certified check, cashier's check, irrevocable letter of credit or, in accordance with Treasury Department regulations, cer-

tain bonds or notes of the United States. Bid guarantees, other than bid bonds, will be returned (a) to unsuccessful bidders as soon as practicable after the opening of bids, and (b) to the successful bidder upon execution of such further contractual documents and bonds as may be required by the bid as accepted.

If the successful bidder, upon acceptance of his bid by the Government within the period specified therein for acceptance (sixty days if no period is specified) fails to execute such further contractual documents, if any, and give such bond(s) as may be required by the terms of the bid as accepted within the time specified (ten days if no period is specified) after receipt of the forms by him, his contract may be terminated for default. In such event he shall be liable for any cost of procuring the work which exceeds the amount of his bid, and the bid guarantee shall be available toward offsetting such difference.

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

(b) The bid form may provide for submission of a price or prices for one or more items, which may be lump sum bids, alternate prices, scheduled items resulting in a bid on a unit of construction or a combination thereof, etc. Where the bid form explicitly requires that the bidder bid on all items, failure to do so will disqualify the bid. When submission of a price on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

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

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

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

~~7. Late Bids and Modifications. Withdrawals.~~  
(This paragraph applies to all advertised solicitations. In the case of Department of Defense negotiated solicitations, it shall also apply to late offers and modifications (other than the normal revisions of offers by selected offerors during the usual conduct of negotiations with such offerors) but not to withdrawal of offers. Unless otherwise provided, this paragraph does not apply to negotiated solicitations issued by civilian agencies.)

(a) Bids and modifications or withdrawals thereof received at the office designated in the invitation for bids after the exact time set for opening of bids will not be considered unless: (1) They are received before award is made; and either (2) they are sent by registered mail, or by certified mail for which an official dated post office stamp (postmark) on the original Receipt for Certified Mail has been obtained and it is determined by the Government that the late receipt was due solely to delay in the mails for which the bidder was not responsible; or (3) if submitted by mail (or by telegram if authorized), it is determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation: *Provided*, That timely receipt at such installation is established upon examination of an appropriate date or time stamp (if any) of such installation or of other documentary evidence of receipt (if readily available) within the control of such installation or of the post office serving it. However, a modification which makes the terms of the otherwise successful bid more favorable to the Government will be considered at any time it is received and may thereafter be accepted.

(b) Bidders using certified mail are cautioned to obtain a Receipt for Certified Mail showing a legible, dated postmark and to retain such receipt against the chance that it will be required as evidence that a late bid was timely mailed.

(c) The time of mailing of late bids submitted by registered or certified mail shall be deemed to be the last minute of the date shown in the postmark on the

~~the Receipt for Certified Mail unless the bidder furnishes evidence from the post office station of mailing which establishes an earlier time. In the case of certified mail, the only acceptable evidence is as follows: (1) Where the Receipt for Certified Mail identifies the post office station of mailing, evidence furnished by the bidder which establishes that the business day of that station ended at an earlier time, in which case the time of mailing shall be deemed to be the last minute of the business day of that station; or (2) an entry in ink on the Receipt for Certified Mail showing the time of mailing and the initials of the postal employee receiving the item and making the entry, with appropriate written verification of such entry from the post office station of mailing, in which case the time of mailing shall be the time shown in the entry. If the postmark on the original Receipt for Certified Mail does not show a date, the bid shall not be considered.~~

8. Withdrawal of Bids. Bids may be withdrawn by written or telegraphic request received from bidders prior to the time set for opening of bids.

9. Public Opening of Bids. Bids will be publicly opened at the time set for opening in the invitation for bids. Their content will be made public for the information of bidders and others interested, who may be present either in person or by representative.

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

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

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

11. Contract and Bonds. The bidder whose bid is accepted will, within the time established in the bid, enter into a written contract with the Government and, if required, furnish performance and payment bonds on Government standard forms in the amounts indicated in the invitation for bids or the specifications.

Paragraph 12 below replaces paragraphs 7 and 8 of Standard Form 22 which have been deleted.

12. LATE BIDS, MODIFICATIONS OF BIDS OR WITHDRAWAL OF BIDS (1979 MAR)

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

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

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

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

(c) The only acceptable evidence to establish:

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

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

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

NOTE: The term "telegram" includes mailgrams.

STANDARD FORM 21  
DECEMBER 1965 EDITION  
GENERAL SERVICES ADMINISTRATION  
FED. PROC. REG. (41 CFR) 1-16.401

**BID FORM**  
**(CONSTRUCTION CONTRACT)**

REFERENCE

DACW09-82-B-0004

*Read the Instructions to Bidders (Standard Form 22)*  
*This form to be submitted in duplicate*

DATE OF INVITATION  
81 DEC 17

NAME AND LOCATION OF PROJECT

SKUNK CREEK CHANNEL AND LEVEES  
AND OVERLOOK (JOMAX) ROAD  
WIDENING AT MARICOPA COUNTY,  
ARIZONA

NAME OF BIDDER (Type or print)

(Date)

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

In compliance with the above-dated invitation for bids, the undersigned hereby proposes to perform all work for construction of Skunk Creek Channel and Levees and Overlook (Jomax) Road Widening.

in strict accordance with the General Provisions, specifications, schedules, drawings, and conditions, for the amounts set forth in the attached Bidding Schedule.

**EQUAL EMPLOYMENT COMPLIANCE (1978 SEP)** By submission of this offer, the offeror represents that, to the best of his knowledge and belief, except as noted below, up to the date of this offer no written notice such as a show cause letter, a letter indicating probable cause, or any other written notification citing specific deficiencies, has been received by the offeror from any Federal Government agency or representative thereof that the offeror or any of its divisions or affiliates or known first-tier subcontractors is in violation of any of the provisions of Executive Order 11246 of September 24, 1965, as amended, or rules and regulations of the Secretary of Labor (41 CFR, Chapter 60) and specifically as to not having an acceptable affirmative action compliance program or being in noncompliance with any other aspect of the Equal Employment Opportunity Program. It is further agreed that should there be any change (i) in the offeror's status or circumstances between this date and the date of expiration of this offer or any extension thereof, or (ii) during any contract or extension thereof resulting from this solicitation, the Contracting Office will be notified promptly.

The undersigned agrees that, upon written acceptance of this bid, mailed or otherwise furnished within 30 calendar days ~~(unless a longer period is allowed)~~ after the date of opening of bids, he will within <sup>5</sup> calendar days (unless a longer period is allowed) after receipt of the prescribed forms, execute Standard Form 23, Construction Contract, and give performance and payment bonds on Government standard forms with good and sufficient surety. (See paragraph No. 19 of the Invitation for Bids).

The undersigned agrees, if awarded the contract, to commence and to complete the work in accordance with the stipulations of Paragraph 1. of the SPECIAL PROVISIONS.

RECEIPT OF AMENDMENTS: The undersigned acknowledges receipt of the following amendments of the invitation for bids, drawings, and/or specifications, etc. (Give number and date of each):

The representations and certifications on the accompanying STANDARD FORM 19-B are made a part of this bid.

ENCLOSED IS BID GUARANTEE, CONSISTING OF		IN THE AMOUNT OF
NAME OF BIDDER (Type or print)	FULL NAME OF ALL PARTNERS (Type or print)	
BUSINESS ADDRESS (Type or print) (Include "ZIP Code")		
Telephone No.		
BY (Signature in ink. Type or print name under signature)		
TITLE (Type or print)		

DIRECTIONS FOR SUBMITTING BIDS: Envelopes containing bids, guarantee, etc., must be sealed, marked, and addressed as follows:

Envelopes shall be marked in the upper left hand corner  
**Bid Under Reference No.**  
 DACW09-82-B-0004

Envelopes shall be addressed:  
 PHOENIX RESIDENT OFFICE  
 2721 North Central Ave.  
 Phoenix, Arizona 85004

**CAUTION—Bids should not be qualified by exceptions to the bidding conditions.**

BIDDING SCHEDULE

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Estimated Amount</u>
-----------------	--------------------	---------------------------	-------------	-------------------	-------------------------

SKUNK CREEK CHANNEL AND LEVEES

1.	DIVERSION AND CONTROL OF WATER, SKUNK CREEK	1	Job	L.S.	_____
2.	CLEAR SITE AND REMOVE OBSTRUCTIONS, SKUNK CREEK	1	Job	L.S.	_____
3.	EXCAVATION, CHANNEL	187,000	Cu. Yd.	_____	_____
4.	EXCAVATION, TOE	71,000	Cu. Yd.	_____	_____
5.	COMPACTED FILL, LEVEE	284,000	Cu. Yd.	_____	_____
6.	MISCELLANEOUS FILL	28,000	Cu. Yd.	_____	_____
7.	BACKFILL, TOE	94,500	Cu. Yd.	_____	_____
8.	CONCRETE, INVERT	1,600	Cu. Yd.	_____	_____
9.	CONCRETE, WALL	250	Cu. Yd.	_____	_____
10.	CONCRETE, WALL FOOTING	500	Cu. Yd.	_____	_____
11.	CONCRETE, CUT-OFF WALL	220	Cu. Yd.	_____	_____
12.	PORTLAND CEMENT	13,200	Cwt.	_____	_____
13.	REINFORCING STEEL	260,000	Lbs.	_____	_____
14.	BEDDING MATERIAL	12,400	Cu. Yd.	_____	_____
15.	STONE, TYPE I	3,400	Ton	_____	_____
16.	STONE, TYPE II	46,800	Ton	_____	_____
17.	STONE PROTECTION	24,900	Cu. Yd.	_____	_____
18.	GROUTING STONE PROTECTION	11,200	Cu. Yd.	_____	_____
19.	BRIDGE PIER MODIFICATION	1	Job	L.S.	_____
20.	SIDE DRAIN BOX CULVERT	1	Job	L.S.	_____
21.	DRAINAGE CHANNEL	1	Job	L.S.	_____

BIDDING SCHEDULE (Continued)

<u>Item No.</u>	<u>Description</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Estimated Amount</u>
22.	GUARDRAIL	500	Lin. Ft.	_____	_____
23.	FENCING, CHAIN-LINK	910	Lin. Ft.	_____	_____
24.	FENCING, BARBED WIRE	290	Lin. Ft.	_____	_____
25.	DOUBLE DRIVE GATE	6	Each	_____	_____
26.	ASPHALT CONCRETE PAVEMENT, SKUNK CREEK	1,430	Ton	_____	_____
27.	TOPSOIL FILL	37,200	Cu. Yd.	_____	_____
28.	SEEDING	1	Job	_____	_____
<u>OVERLOOK ROAD (JOMAX) WIDENING</u>					
29.	DIVERSION AND CONTROL OF WATER, OVERLOOK ROAD	1	Job	L.S.	_____
30.	CLEAR SITE AND REMOVE OBSTRUCTIONS, OVERLOOK ROAD	1	Job	L.S.	_____
31.	EXCAVATION, ROAD	24,800	Cu. Yd.	_____	_____
32.	COMPACTED FILL, ROAD	21,600	Cu. Yd.	_____	_____
33.	STONE, TYPE I	20	Ton	_____	_____
34.	REMOVE AND REPLACE EXISTING STONE PROTECTION	1	Job	L.S.	_____
35.	REMOVE EXISTING ASPHALT CONCRETE PAVEMENT	1	Job	L.S.	_____
36.	ASPHALT CONCRETE PAVEMENT, OVERLOOK ROAD	1,100	Ton	_____	_____
37.	CORRUGATED METAL PIPE, 36-INCH	20	Lin. FT.	_____	_____
38.	CORRUGATED METAL PIPE ARCH, 29 X 18, INCH	20	Lin. Ft.	_____	_____
<b>TOTAL ESTIMATED AMOUNT</b>					<b>\$ _____</b>

BIDDING SCHEDULE (Continued)

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

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

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

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

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

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

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

DATE OF BID

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

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

**1. SMALL BUSINESS**

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

**2. MINORITY BUSINESS ENTERPRISE**

He  is,  is not, a minority business enterprise as defined in 13 CFR 121.101, at least 51 percent of the stock of which is owned by minority group members or, in case of publicly owned concerns, at least 51 percent of the stock of which is owned by minority group members." For the purpose of this definition, minority group members are Negroes, Spanish-speaking Americans, Chinese, American-Orientals, American-Indians, American-Eskimos, and American-Alaskans."

**3. CONTINGENT FEE**

He  is,  is not, authorized to employ any person (other than a full-time bona fide employee working solely for the bidder) to solicit or secure this contract, and (b) he  has,  has not, agreed to pay any company or person (other than a full-time bona fide employee working solely for the bidder) any fee, commission, percentage or brokerage fee, contingent upon or derived from the award of this contract; and agrees to furnish information relating to (a) and (b) above as requested by the Contracting Officer. (For interpretation of the representation, including the definition of "bona fide employee" see Code of Federal Regulations, Title 41, Subpart 101-11.2.)

**4. TYPE OF ORGANIZATION**He operates as an  individual,  partnership,  joint venture,  corporation, incorporated in State of .....**5. INDEPENDENT PRICE DETERMINATION**

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

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

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

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

(b) Each person signing this bid certifies that:

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

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

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

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

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

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

**6. EQUAL OPPORTUNITY**

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

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

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

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

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

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

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

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

EMPLOYER IDENTIFICATION NUMBER OF		PARENT COMPANY	BIDDER
-----------------------------------	--	----------------	--------

**8. CERTIFICATION OF NONSEGREGATED FACILITIES**

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

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

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

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

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

**9. CLEAN AIR AND WATER**

(Applicable if the bid or offer exceeds \$100,000, or the contracting officer has determined that orders under an indefinite quantity contract in any year will exceed \$100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-3(c)(1)) or the Federal Water Pollution Control Act (33 U.S.C. 1319(c)) and is listed by EPA, or is not otherwise exempt.)

The bidder or offeror certifies as follows:

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

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

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

Alterations to Standard Form 19-8, REPRESENTATIONS AND CERTIFICATIONS

Delete Item No. 2, MINORITY BUSINESS ENTERPRISE and insert the following:

2. SMALL DISADVANTAGED BUSINESS CONCERN

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

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

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

(b) The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans (such as American Indians, Eskimos, Aleuts, and native Hawaiians), and other minorities or any other individuals found to be disadvantaged by the Small Business Administration pursuant to Section 8(a) of the Small Business Act.

After Item No. 3, CONTINGENT FEE, the following clause has been added:

"If the offeror/quoter, by checking the appropriate box provided therefor, has represented that he has employed or retained a company or person (other than a full-time bona fide employee working solely for the offeror/quoter) to solicit or secure this contract, or that he has paid or agreed to pay any fee, commission, percentage, or brokerage fee to any company or person contingent upon or resulting from the award of this contract, he shall furnish, in duplicate, a complete Standard Form 119, Contractor's Statement of Contingent or Other Fees. If offeror/quoter has previously furnished a completed Standard Form 119 to the office issuing this solicitation, he may accompany his proposal/quotation with a signed statement (a) indicating when such completed form was previously furnished, (b) identifying by number the previous solicitation or contract, if any, in connection with which such form was submitted, and (c) representing that the statement in such form is applicable to this proposal/quotation."  
(ASPR 7-2002.1)

Standard Form 19-B, REPRESENTATIONS AND CERTIFICATIONS (continued)

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

10. WOMAN-OWNED BUSINESS.

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

11. PERCENT FOREIGN CONTENT.

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

12. CERTIFICATION-WAGE AND PRICE STANDARDS.

(Applicable to awards in excess of \$5 million, and awards of indefinite delivery type contracts under which cumulative orders are expected to exceed \$5 million.)

(a) By submission of this bid or offer, the bidder or offeror certifies that he is in compliance with the Wage and Price Standards issued by the Council on Wage and Price Stability (6 CFR Part 705, Appendix, and Part 706).

(b) The clause entitled, "Certification - Wage and Price Standards," set forth elsewhere in this solicitation, shall be incorporated in any resulting contract except where waived by agency head involved.

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

# CONSTRUCTION CONTRACT

(See instructions on reverse)

CONTRACT NO

DATE OF CONTRACT

Rev. LAD Nov. 70

NAME AND ADDRESS OF CONTRACTOR

CHECK APPROPRIATE BOX

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

DEPARTMENT OR AGENCY

CONTRACT FOR (*Work to be performed*)

PLACE

CONTRACT PRICE (*Express in words and figures*)

ADMINISTRATIVE DATA (*Optional*)

The United States of America (hereinafter called the Government), represented by the Contracting Officer executing this contract, and the individual, partnership, joint venture, or corporation named above (hereinafter called the Contractor), mutually agree to perform this contract in strict accordance with the General Provisions, and the following designated specifications, schedules, drawings, and conditions:

WORK SHALL BE STARTED

WORK SHALL BE COMPLETED

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

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

THE UNITED STATES OF AMERICA

CONTRACTOR

By \_\_\_\_\_

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

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

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

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

---

### INSTRUCTIONS

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

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

INDEX OF GENERAL PROVISIONS  
(Construction Contract)  
Edition of 29 July 1980

- 1.1 Definitions
- 1.2 Definitions
2. Specifications and Drawings
3. Changes
4. Differing Site Conditions
5. Termination for Default-Damages for Delay-Time Extensions
6. Disputes
7. Payments to Contractor
8. Assignment of Claims
9. Material and Workmanship
10. Inspection and Acceptance
11. Superintendence by Contractor
12. Permits and Responsibilities
13. Conditions Affecting the Work
14. Other Contracts
15. Shop Drawings
16. Use and Possession Prior to Completion
17. Suspension of Work
18. Termination for Convenience of the Government-Construction
19. Pricing of Adjustments
20. Patent Indemnity
21. Additional Bond Security
22. Examination of Records by Comptroller General
23. Buy American Act
24. Equal Opportunity

25. Covenant Against Contingent Fees
26. Officials Not to Benefit
27. Convict Labor
28. Utilization of Small Business and Small Disadvantaged Business Concerns
29. Federal, State and Local Taxes
30. Davis-Bacon Act
31. Contract Work Hours and Safety Standards Act-Overtime Compensation
32. Apprentices and Trainees
33. Payrolls and Basic Records
34. Compliance with Copeland Regulations
35. Withholding of Funds
36. Subcontracts
37. Contract Termination-Debarment
38. Disputes Concerning Labor Standards
39. Contractor Inspection System
40. Gratuities
41. Subcontracting Plan for Small Business and Small Disadvantaged Business Concerns (Formally Advertised)
42. Notice and Assistance Regarding Patent and Copyright Infringement
43. Authorization and Consent
44. Composition of Contractor
45. Site Investigation
46. Protection of Existing Vegetation, Structures, Utilities, and Improvements
47. Operations and Storage Areas
48. Modification Proposals-Price Breakdown
49. Subcontractors
50. Cleaning Up
51. Additional Definitions

52. Accident Prevention
53. Government Inspectors
54. Rights in Shop Drawings
55. Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era
56. Value Engineering Incentive--Construction
57. Affirmative Action for Handicapped Workers
58. Clean Air and Water
59. Notice to the Government of Labor Disputes
60. Contract Prices-Bidding Schedule
61. Priorities, Allocations, and Allotments
62. Price Reduction for Defective Cost or Pricing Data-Price Adjustments
63. Interest
64. Audit by Department of Defense
65. Subcontractor Cost or Pricing Data-Price Adjustments
- 66.1 Government-Furnished Property (Short Form)
- 66.2 Government Property (Fixed Price)
67. Variations in Estimated Quantities
68. Progress Charts and Requirements for Overtime Work
69. Certification of Requests for Adjustment or Relief Exceeding \$100,000
70. Affirmative Action Compliance Requirements for Construction
71. Utilization of Women-Owned Business Concerns (Over \$10,000)
72. Environmental Litigation

GENERAL PROVISIONS  
(Construction Contract)  
(Edition of 29 July 1980)

Issued By: Department of the Army, Corps of Engineers

(General Provisions 1 through 29 and 30 through 38 are those prescribed by the General Services Administration in Standard Form 23-A, April 1975 edition and Standard Form 19-A, January 1979 edition, respectively, as amended pursuant to the latest revisions of the Defense Acquisition Regulation and Engineer Contract Instructions, ER 1180-1-1.)

1.1 DEFINITIONS

(The following clause is applicable if the procurement instrument identification number is prefixed by the letters "DACW")

(a) The term "head of the agency" or "Secretary" as used herein means the Secretary of the Army; and the term "his duly authorized representative" means the Chief of Engineers, Department of the Army, or an individual or board designated by him.

(b) The term "Contracting Officer" as used herein means the person executing this contract on behalf of the Government and includes a duly appointed successor or authorized representative. (DAR 7-602.1 & ECI 7-070)

1.2 DEFINITIONS (1964 JUN)

(The following clause is applicable if the procurement instrument identification number is prefixed by the letters "DACA")

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

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

2. SPECIFICATIONS AND DRAWINGS (1964 JUN)

The Contractor shall keep on the work a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy either in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at his own risk and expense. The Contracting Officer shall furnish from time to time such detail drawings and other information as he may consider necessary, unless otherwise provided. (DAR 7-602.2)

3. CHANGES (1968 FEB)

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

- (i) in the specifications (including drawings and designs);
- (ii) in the method or manner of performance of the work;
- (iii) in the Government-furnished facilities, equipment, materials, services, or site; or
- (iv) directing acceleration in the performance of the work.

(b) Any other written order or an oral order (which terms as used in this paragraph (b) shall include direction, instruction, interpretation or determination) from the Contracting Officer, which causes any such change, shall be treated as a change order under this clause, provided, that the Contractor gives the Contracting Officer written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a change order.

(c) Except as herein provided, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment hereunder.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any order, an equitable adjustment shall be made and the contract modified in writing accordingly: Provided however, That except for claims based on defective specifications, no claim for any change under (b) above shall be allowed for any costs incurred more than 20 days before the Contractor gives written notice as therein required: And provided further, That in the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with such defective specifications.

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

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

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

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

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

(c) No claim by the Contractor for an equitable adjustment hereunder

shall be allowed if asserted after final payment under this contract. (DAR 7-602.4)

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

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

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

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

(d) The Contractor's right to proceed shall not be so terminated nor the Contractor charged with resulting damage if:

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

(2) The Contractor, within 10 days from the beginning of any such delay (unless the Contracting Officer grants a further period of time before the date of final payment under the contract), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the work when, in his judgment, the findings of fact justify such an extension, and his findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in the "Disputes" clause of this contract.

(e) If, after notice of termination of the Contractor's right to proceed under the provisions of this clause, it is determined for any reason that the Contractor was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, the rights and obligations of the parties shall, if the contract contains a clause providing for termination for convenience of the Government, be the same as if the notice of termination had been issued pursuant to such clause. If, in the foregoing circumstances, this contract does not contain a clause providing for

termination for convenience of the Government, the contract shall be equitably adjusted to compensate for such termination and the contract modified accordingly; failure to agree to any such adjustment shall be a dispute concerning a question of fact within the meaning of the clause of this contract entitled "Disputes."

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

(g) As used in paragraph (d)(1) of this clause, the term "subcontractors or suppliers" means subcontractors or suppliers at any tier. (DAR 7-602.5)

#### 6. DISPUTES (1980 JUN)

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

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

(c) (i) As used herein, "claim" means a written demand or assertion by one of the parties seeking, as a matter of right, the payment of money, adjustment or interpretation of contract terms, or other relief, arising under or relating to this contract. However, a written demand by the contractor seeking the payment of money in excess of \$50,000 is not a claim until certified in accordance with (d) below.

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

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

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

(e) For contractor claims of \$50,000 or less, the Contracting Officer must, if requested in writing by the contractor, render a decision within 60 days of the request. For contractor certified claims in excess of \$50,000 the Contracting Officer must decide the claim within 60 days or notify the contractor of the date when the decision will be made.

(f) The Contracting Officer's decision shall be final unless the contractor appeals or files a suit as provided in the Act.

(g) Interest on the amount found due on a contractor claim shall be paid from the date the contracting officer receives the claim, or from the date payment otherwise would be due, if such date is later, until the date of payment.

(h) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal or action arising under the contract, and comply with any decision of the Contracting Officer. (DAR 7-103.12(a))

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

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

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

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

(d) All material and work covered by progress payments made shall thereupon become the sole property of the Government, but this provision shall not be construed as relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work, or as waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(e) The Contractor shall, upon request, be reimbursed for the entire amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after furnishing evidence of full payment to the surety.

(f) Upon completion and acceptance of all work, the amount due the Contractor under this contract shall be paid upon the presentation of a properly executed voucher and after the Contractor shall have furnished the Government with a release of all claims against the Government arising by virtue of this contract, other than claims in stated amounts as may be specifically excepted by the Contractor from the operation of the release. If the Contractor's claim to amounts payable under the contract has been assigned under the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), a release may also be required of the assignee. (DAR 7-602.7)

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

(a) Pursuant to the provisions of the Assignment of Claims Act of 1940, as amended (31 U.S.C. 203, 41 U.S.C. 15), if this contract provides for

payments aggregating \$1,000 or more, claims for moneys due or to become due the Contractor from the Government under this contract may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency, and may thereafter be further assigned and reassigned to any such institution. Any such assignment or reassignment shall cover all amounts payable under this contract and not already paid, and shall not be made to more than one party, except that any such assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in such financing. Unless otherwise provided in this contract, payments to assignee of any moneys due or to become due under this contract shall not, to the extent provided in said Act, as amended, be subject to reduction or setoff. (The preceding sentence applies only if this contract is made in time of war or national emergency as defined in said Act and is with the Department of Defense, the General Services Administration, the Energy Research and Development Administration, the National Aeronautics and Space Administration, the Federal Aviation Administration, or any other department or agency of the United States designated by the President pursuant to Clause 4 of the provision of section 1 of the Assignment of Claims Act of 1940, as amended by the Act of May 15, 1951, 65 Stat. 41.)

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

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

(a) Unless otherwise specifically provided in this contract, all equipment, material, and articles incorporated in the work covered by this contract are to be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in this contract, reference to any equipment, material, article, or patented process, by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition, and the Contractor may, at his option, use any equipment, material, article, or process which, in the judgment of the Contracting Officer, is equal to that named. The Contractor shall furnish to the Contracting Officer for his approval the name of the manufacturer, the model number, and other identifying data and information respecting the performance, capacity, nature, and rating of the machinery and mechanical and other equipment which the Contractor contemplates incorporating in the work. When required by this contract or when called for by the Contracting Officer, the Contractor shall furnish the Contracting Officer for approval full information concerning the material or articles which he contemplates incorporating in the work. When so directed, samples shall be submitted for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles installed or used without required approval shall be at the risk of subsequent rejection.

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

## 10. INSPECTION AND ACCEPTANCE (1976 OCT)

(a) All work (which term includes but is not restricted to materials, workmanship, and manufacture and fabrication of components) shall be subject to inspection and test by the Government at all reasonable times and at all places prior to acceptance. Any such inspection and test is for the sole benefit of the Government and shall not relieve the Contractor of the responsibility of providing quality control measures to assure that the work strictly complies with the contract requirements. No inspection or test by the Government shall be construed as constituting or implying acceptance. Inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance, nor in any way affect the continuing rights of the Government after acceptance of the completed work under the terms of paragraph (f) of this clause, except as hereinabove provided.

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

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

(d) The Contractor shall furnish promptly, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspection and test as may be required by the Contracting Officer. All inspection and test by the Government shall be performed in such manner as not unnecessarily to delay the work. Special, full size, and performance tests shall be performed as described in this contract. The Government reserves the right to charge to the Contractor any additional cost of inspection or test when material or workmanship is not ready at the time specified by the Contractor for inspection or test or when reinspection or retest is necessitated by prior rejection.

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

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

11. SUPERINTENDENCE BY CONTRACTOR (1976 OCT)

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

12. PERMITS AND RESPONSIBILITIES (1964 JUN)

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

13. CONDITIONS AFFECTING THE WORK (1964 JUN)

The Contractor shall be responsible for having taken steps reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Any failure by the Contractor to do so will not relieve him from responsibility for successfully performing the work without additional expense to the Government. The Government assumes no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of this contract, unless such understanding or representations by the Government are expressly stated in the contract. (DAR 7-602.14)

14. OTHER CONTRACTS (1964 JUN)

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

15. SHOP DRAWINGS (1976 OCT)

(a) The term, "shop drawings", includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data; and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract.

(b) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate his approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate his approval or disapproval of the shop drawings and if not approved as submitted shall indicate his reasons therefor. Any work done prior to such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from 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 (c) below.

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

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

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

The Government shall have the right to take possession of or use any completed or partially completed part of the work. Prior to such possession or use, the Contracting Officer shall furnish the Contractor an itemized list of work remaining to be performed or corrected on such portions of the project as are to be possessed or used by the Government, provided that failure to list any item of work shall not relieve the Contractor of responsibility for compliance with the terms of the contract. Such possession or use shall not be deemed an acceptance of any work under the contract. While the Government has such possession or use, the Contractor, notwithstanding the provisions of the clause of this contract entitled "Permits and Responsibilities," shall be relieved of the responsibility for the loss or damage to the work resulting from the Government's possession or use. If such prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment in the contract price or the time of completion will be made and the contract shall be modified in writing accordingly. (DAR 7-602.39)

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

(a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as he may determine to be appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the Contracting Officer in the administration of this contract, or by his failure to act within the time specified in this contract (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent (1) that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or (2) for which an equitable adjustment is provided for or excluded under any other provision of this contract.

(c) No claim under this clause shall be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order),

and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract. (DAR 7-602.46)

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

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

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

- (i) stop work under the contract on the date and to the extent specified in the Notice of Termination;
- (ii) place no further orders or subcontracts for materials, services or facilities, except as may be necessary for completion of such portion of the work under the contract as is not terminated;
- (iii) terminate all orders and subcontracts to the extent that they relate to the performance of work terminated by the Notice of Termination;
- (iv) assign to the Government, in the manner, at the times, and to the extent directed by the Contracting Officer, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Government shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;
- (v) settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contracting Officer, to the extent he may require, which approval or ratification shall be final for all the purposes of this clause;
- (vi) transfer title and deliver to the Government, in the manner, at the times, and to the extent, if any, directed by the Contracting Officer, (A) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced as a part of, or acquired in connection with the performance of, the work terminated by the Notice of Termination, and (B) the completed or partially completed plans, drawings, information, and other property which, if the contract had been completed, would have been required to be furnished to the Government;
- (vii) use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any property of the types referred to in (vi) above; provided however, that the Contractor (A) shall not be required to extend credit to any purchaser, and (B) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Contracting Officer; and provided further, that the proceeds of any such transfer or disposition shall be applied in

reduction of any payments to be made by the Government to the Contractor under this contract or shall otherwise be credited to the price or cost of the work covered by this contract or paid in such other manner as the Contracting Officer may direct;

- (viii) complete performance of such part of the work as shall not have been terminated by the Notice of Termination; and
- (ix) take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to this contract which is in the possession of the Contractor and in which the Government has or may acquire an interest.

At any time after expiration of the plant clearance period, as defined in Section VIII, Defense Acquisition Regulation, as it may be amended from time to time, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory not previously disposed of, exclusive of items the disposition of which has been directed or authorized by the Contracting Officer, and may request the Government to remove such items or enter into a storage agreement covering them. Not later than fifteen (15) days thereafter, the Government will accept title to such items and remove them or enter into a storage agreement covering the same; provided, that the list submitted shall be subject to verification by the Contracting Officer upon removal of the items, or if the items are stored, within forty-five (45) days from the date of submission of the list, and any necessary adjustment to correct the list as submitted shall be made prior to final settlement.

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

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

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

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

(A) the cost of such work;

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

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

(ii) the reasonable cost of the preservation and protection of property incurred pursuant to paragraph (b)(ix); and any other reasonable cost incidental to termination of work under this contract, including expense incidental to the determination of the amount due to the Contractor as the result of the termination of work under this contract. The total sum to be paid to the Contractor under (i) above shall not exceed the total contract price as reduced by the amount of payments otherwise made and as further reduced by the contract price of work not terminated. Except for normal spoilage, and except to the extent that the Government shall have otherwise expressly assumed the risk of loss, there shall be excluded from the amounts payable to the Contractor under (i) above, the fair value, as determined by the Contracting Officer, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government, or to a buyer pursuant to paragraph (b)(vii).

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

(g) The Contractor shall have the right of appeal, under the clause of this contract entitled "Disputes", from any determination made by the Contracting Officer under paragraph (c), (e), or (i) hereof, except that if the Contractor has failed to submit his claim within the time provided in paragraph (c) or (i) hereof, and has failed to request extension of such time,

he shall have no such right of appeal. In any case where the Contracting Officer has made a determination of the amount due under paragraph (c), (e) or (i) hereof, the Government shall pay to the Contractor the following: (i) if there is no right of appeal hereunder or if no timely appeal has been taken, the amount so determined by the Contracting Officer, or (ii) if an appeal has been taken, the amount finally determined on such appeal.

(h) In arriving at the amount due the Contractor under this clause there shall be deducted (i) all unliquidated advance or other payments on account theretofore made to the Contractor, applicable to the terminated portion of this contract, (ii) any claim which the Government may have against the Contractor in connection with this contract, and (iii) the agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the Contractor or sold, pursuant to the provisions of this clause, and not otherwise recovered by or credited to the Government.

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

(j) The Government may from time to time, under such terms and conditions as it may prescribe, make partial payments and payments on account against costs incurred by the Contractor in connection with the terminated portion of this contract whenever in the opinion of the Contracting Officer the aggregate of such payments shall be within the amount to which the Contractor will be entitled hereunder. If the total of such payments is in excess of the amount finally agreed or determined to be due under this clause, such excess shall be payable by the Contractor to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury pursuant to Public Law 92-41, 85 STAT 97 for the Renegotiation Board, for the period from the date such excess payment is received by the Contractor to the date on which such excess is repaid to the Government; provided, however, that no interest shall be charged with respect to any such excess payment attributable to a reduction in the Contractor's claim by reason of retention or other disposition of termination inventory until ten days after the date of such retention or disposition, or such later date as determined by the Contracting Officer by reason of the circumstances.

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

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

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

20. PATENT INDEMNITY (1964 JUN)

Except as otherwise provided, the Contractor agrees to indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement upon any Letters Patent of the United States (except Letters Patent issued upon an application which is now or may hereafter be, for reasons of national security, ordered by the Government to be kept secret or otherwise withheld from issue) arising out of the performance of this contract or out of the use or disposal by or for the account of the Government of supplies furnished or construction work performed hereunder. (DAR 7-602.16(a))

21. ADDITIONAL BOND SECURITY (1976 OCT)

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

22. EXAMINATION OF RECORDS BY COMPTROLLER GENERAL (1975 JUN)

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

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

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

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

23. BUY AMERICAN ACT (1966 OCT)

(a) Agreement. In accordance with the Buy American Act (41 U.S.C. 10a-10d), the Contractor agrees that only domestic construction material will be used (by the Contractor, subcontractors, materialmen, and suppliers) in the performance of this contract, except for nondomestic construction material listed in the "Nondomestic Construction Materials" clause, if any, of this contract.

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

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

24. EQUAL OPPORTUNITY (1978 SEP)

(If, during any twelve (12) month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded Federal contracts and/or subcontracts which have an aggregate value in excess of \$10,000, the Contractor shall comply with (1) through (7) below. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.)

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

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this Equal Opportunity clause.

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

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

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

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

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

(7) The Contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order No. 11375 of October 13, 1967, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States. (DAR 7-103.18(a))

#### 25. COVENANT AGAINST CONTINGENT FEES (1958 JAN)

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the Government shall have the right to annul this contract without liability or in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such commissions, percentage, brokerage or contingent fee. (DAR 7-103.20)

#### 26. OFFICIALS NOT TO BENEFIT (1949 JUL)

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit. (DAR 7-103.19)

#### 27. CONVICT LABOR (1975 OCT)

In connection with the performance of work under this contract, the Contractor agrees not to employ any person undergoing sentence of imprisonment

except as provided by Public Law 89-176, September 10, 1965 (18 U.S.C. 4082(c)(2)) and Executive Order 11755, December 29, 1973. (DAR 7-104.17)

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

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

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with the efficient performance of this contract. The term "subcontract" means any agreement (other than one involving an employer-employee relationship) to be entered into by a Federal Government prime contractor or subcontractor calling for supplies or services required for the performance of the original contract or subcontract. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

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

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

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

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

29. FEDERAL, STATE, AND LOCAL TAXES (1971 NOV)

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

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

(1) results in the Contractor being required to pay or bear the burden of any such Federal excise tax or duty or increase in the rate thereof which would not otherwise have been payable on such transactions or property, the contract price shall be increased by the amount of such tax or duty or rate increase, provided the Contractor warrants in writing that no amount for

such newly imposed Federal excise tax or duty or rate increase was included in the contract price as a contingency reserve or otherwise; or

(2) results in the Contractor not being required to pay or bear the burden of, or in his obtaining a refund or drawback of, any such Federal excise tax or duty which would otherwise have been payable on such transactions or property or which was the basis of an increase in the contract price, the contract price shall be decreased by the amount of the relief, refund, or drawback, or that amount shall be paid to the Government, as directed by the Contracting Officer. The contract price shall be similarly decreased if the Contractor, through his fault or negligence or his failure to follow instructions of the Contracting Officer, is required to pay or bear the burden of, or does not obtain a refund or drawback of, any such Federal excise tax or duty.

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

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

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

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

(g) The Contractor shall promptly notify the Contracting Officer of matters which will result in either an increase or decrease in the contract price and shall take action with respect thereto as directed by the Contracting Officer. (DAR 7-103.10(a))

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

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Acts and to insert this clause in all subcontracts hereunder with private persons or firms)

(a) All mechanics and laborers, including apprentices and trainees, employed or working directly upon the site of the work shall be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Copeland Regulations (29 CFR, Part 3)), the full amounts due at time of payment computed at wage rates not less than the aggregate of the basic hourly rates and the rates of payments, contributions, or costs for any fringe benefits contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor or subcontractor and such laborers and mechanics. A copy of such wage determination decision shall be kept posted by the Contractor at the site of the work in a prominent place where it can be easily seen by the workers. The term mechanics and laborers shall be deemed to include apprentices and trainees not covered by an approved program as provided by the apprentice and trainee clause of the contract.

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

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

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

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

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

(e) In the event it is found by the Contracting Officer that any laborer or mechanic, including all apprentices and trainees, employed by the Contractor or any subcontractor directly on the site of the work covered by this contract has been or is being paid at a rate of wages less than the rate of wages required by paragraph (a) of this clause, or by the "Apprentices and Trainees" clause of this contract, the Contracting Officer may (i) by written notice to the Government Prime Contractor terminate his right to proceed with the work, or such part of the work as to which there has been a failure to pay said required wages, and (ii) prosecute the work to completion by contract or otherwise, whereupon such Contractor and his sureties shall be liable to the Government for any excess costs occasioned the Government thereby.

(f) Paragraphs (a) through (e) of the clause shall apply to this contract to the extent that it is (i) a prime contract with the Government subject to

the Davis-Bacon Act or (ii) a subcontract also subject to the Davis-Bacon Act under such prime contract. (DAR 7-602.23(a)(i))

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

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

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

(a) The Contractor shall not require or permit any laborer or mechanic, including apprentices, trainees, watchmen, and guards in any workweek in which he is employed on any work under this contract to work in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such workweek on work subject to the provisions of the Contract Work Hours and Safety Standards Act unless such laborer or mechanic, including apprentices, trainees, watchmen, and guards, receives compensation at a rate not less than one and one-half times his basic rate of pay for all such hours worked in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such workweek, whichever is the greater number of overtime hours. The "basic rate of pay," as used in this clause, shall be the amount paid per hour, exclusive of the Contractor's contribution or cost for fringe benefits and any cash payment made in lieu of providing fringe benefits, or the basic hourly rate contained in the wage determination, whichever is greater.

(b) In the event of any violation of the provisions of paragraph (a), the Contractor shall be liable to any affected employee for any amounts due, and to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including an apprentice, trainee, watchman, or guard, employed in violation of the provisions of paragraph (a) in the sum of \$10 for each calendar day on which such employee was required or permitted to be employed on such work in excess of eight (8) hours or in excess of the standard workweek of forty (40) hours without payment of the overtime wages required by paragraph (a). (DAR 7-602.23(a)(ii))

32. APPRENTICES AND TRAINEES (1977 DEC)

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

(a) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a state apprenticeship agency recognized by the Bureau, or if a person is employed in his first ninety (90) days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a state apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen in any craft classification employed on this contract shall not be greater than the ratio permitted to the Contractor as to his entire work force under the register

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

(b) Trainees will be permitted to work at less than the predetermined rate for the work performed when they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification, by the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training. The ratio of trainees to journeymen on this contract shall not be greater than permitted under the plan approved by the Bureau of Apprenticeship and Training. Every trainee must be paid at not less than the rate specified in the approved program for his level of progress. Any employee listed on the payroll at a trainee rate who is not registered and not participating in a training plan approved by the Bureau of Apprenticeship and Training shall be paid not less than the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The Contractor or subcontractor shall furnish the Contracting Officer written evidence of the certification of his program, the registration of the trainee, and the ratios and wage rates prescribed in that program. In the event the Bureau of Apprenticeship and Training withdraws the approval of a training program, the Contractor shall no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of this contract. (DAR 7-602.23(a)(iii))

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

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

(a) The Contractor shall maintain payrolls and basic records relating thereto during the course of the work and shall preserve them for a period of three (3) years thereafter for all laborers and mechanics, including apprentices, trainees, watchmen, and guards, working at the site of the work. Such records shall contain the name and address of each such employee, his correct classification, rate of pay (including rates of contributions for, or costs assumed to provide, fringe benefits), daily and weekly number of hours worked, deductions made and actual wages paid. (NOTE: Watchmen and guards are reflected on payroll records for Contract Work Hours and Safety Standards Act purposes only.) Whenever the Contractor has obtained approval from the Secretary of Labor as provided in paragraph (c) of the clause entitled "Davis-Bacon Act," he shall maintain records which show the commitment, its approval, written communication of the plan or program to the laborers or mechanics affected, and the costs anticipated or incurred under the plan or program.

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

(c) The Contractor shall make the records required under this clause available for inspection by authorized representatives of the Contracting Officer and the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. (DAR 7-602.23(a)(iv))

34. COMPLIANCE WITH COPELAND REGULATIONS (1964 JUN)

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

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

35. WITHHOLDING OF FUNDS (1977 DEC)

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

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

(b) If the Contractor or any subcontractor fails to pay any laborer, mechanic, apprentice, trainee, watchman, or guard employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Government Prime Contractor, take such action as may be necessary to cause suspension of any further payments or advances until such violations have ceased. (DAR 7-602.23(a)(vi))

36. SUBCONTRACTS (1972 FEB)

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

The Contractor agrees to insert the clauses hereof entitled "Davis-Bacon Act," "Contract Work Hours and Safety Standards Act-Overtime Compensation," "Apprentices and Trainees," "Payrolls and Basic Records," "Compliance with Copeland Regulations," "Withholding of Funds," "Subcontracts," and "Contract Termination-Debarment" in all subcontracts. The term "Contractor" as used in such clauses in any subcontract shall be deemed to refer to the subcontractor except in the phrase "Government Prime Contractor." (DAR 7-602.23(a)(vii))

37. CONTRACT TERMINATION - DEBARMENT (1972 APR)

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

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

38. DISPUTES CONCERNING LABOR STANDARDS (1977 DEC)

(If this contract is with a State or political subdivision thereof, the Contractor agrees to comply with the requirements of the Contract Work Hours Standards Act and to insert this clause in all subcontracts hereunder with private persons or firms)

Disputes arising out of the labor standards provisions of this contract shall be subject to the Disputes clause except to the extent such disputes involve the meaning of classifications or wage rates contained in the wage determination decision of the Secretary of Labor or the applicability of the labor provisions of this contract which questions shall be referred to the Secretary of Labor in accordance with the procedures of the Department of Labor. (DAR 7-602.23(a)(ix))

39. CONTRACTOR INSPECTION SYSTEM (1964 NOV)

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

40. GRATUITIES (1952 MAR)

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

(b) In the event this contract is terminated as provided in paragraph (a) hereof, the Government shall be entitled (i) to pursue the same remedies against the Contractor as it could pursue in the event of a breach of the

contract by the Contractor, and (ii) as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Secretary or his duly authorized representative) which shall be not less than three nor more than ten times the costs incurred by the Contractor in providing any such gratuities to any such officer or employee.

(c) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract. (DAR 7-104.16)

#### 41. SUBCONTRACTING PLAN FOR SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS CONCERNS (FORMALLY ADVERTISED) (1980 AUG)

(The following clause is applicable if this contract (1) offers subcontracting possibilities, (2) is expected to exceed \$500,000, or \$1,000,000 in the case of construction of any public facility, and (3) is required to include the clause in DAR 7-104.14(a))

(a) This provision does not apply to small business concerns.

(b) The apparent low bidder, upon request by the Contracting Officer, shall submit a subcontracting plan which addresses separately subcontracting with small business concerns and small disadvantaged business concerns, and which shall be included in and made a material part of the resultant contract. The subcontracting plan shall be submitted within the time specified by the Contracting Officer. Failure to submit the subcontracting plan shall make the bidder ineligible for award of a contract. As a minimum, the subcontracting plan shall include -

(1) Separate percentage goals (expressed in terms of percentage of total planned subcontracting dollars) for the utilization as subcontractors of small business concerns and small business concerns owned and controlled by socially and economically disadvantaged individuals. For the purposes of the subcontracting plan, the Contractor shall include all subcontracts to be awarded for the specific purpose of performing this contract and may include a proportionate share of supplies and services whose costs are normally allocated as indirect or overhead costs when reasonably determined to be attributable to this contract.

a. A statement of: (i) total dollars planned to be subcontracted; (ii) total dollars planned to be subcontracted to small business; and (iii) total dollars planned to be subcontracted to small disadvantaged business.

b. A description of the principal supply and service areas to be subcontracted and an identification of those areas where it is planned to use (i) small business subcontractors, and (ii) small disadvantaged business subcontractors.

c. A statement of the method used in developing proposed subcontracting goals for small business and small disadvantaged business concerns.

d. If the offeror includes indirect and overhead costs as an element in establishing the goals in the subcontracting plan, the method used in determining the proportionate share of indirect and overhead costs incurred with (i) small business, and (ii) small disadvantaged business subcontractors shall be explained.

e. A statement of the method used for solicitation purposes (e.g., did the offeror use company source lists, the small business and disadvantaged small business source identification system provided by the Small Business Administration's Procurement Automated Source System, the National Minority Purchasing Council Vendor Information Service, or the services provided by the U.S. Department of Commerce Minority Business

Development Agency's Research and Information Division, and the facilities of small business and disadvantaged business trade associations?).

(2) The name of an individual within the employ of the bidder who will administer the subcontracting plan of the bidder and a description of the duties of such individual;

(3) A description of the efforts the bidder will make to assure that small business and small disadvantaged business concerns will have an equitable opportunity to compete for subcontracts;

(4) Assurances that the bidder will include the clause entitled "Utilization of Small Business and Small Disadvantaged Business Concerns" in all subcontracts which offer further subcontracting possibilities in the United States and that the bidder will require all subcontractors (except small business concerns) who receive subcontracts in excess of \$1,000,000 in the case of a contract for the construction of any public facility, or in excess of \$500,000 in the case of all other contracts, to adopt a plan in consonance with this clause;

(5) Assurances that the bidder will submit such periodic reports and cooperate in any studies or surveys as may be required by the contracting agency or the Small Business Administration in order to determine the extent of compliance by the bidder with the subcontracting plan; and

(6) A recitation of the types of records the successful bidder will maintain to demonstrate procedures which have been adopted to comply with the requirements and goals set forth in the plan, including the establishment of source lists of small business concerns and small disadvantaged business concerns; and efforts to identify and award subcontracts to such small business concerns. The records shall include at least the following (these records may be maintained on a plant-wide or company-wide basis unless otherwise indicated):

a. Small and disadvantaged business source lists, guides, and other data identifying small and small disadvantaged business vendors.

b. Organizations contacted for small and disadvantaged business sources.

c. On a contract-by-contract basis, records on all subcontract solicitations over \$100,000, indicating on each solicitation (i) whether small business was solicited and if not, why not; (ii) whether small disadvantaged business was solicited and if not, why not; and (iii) reasons for the failure of responding small businesses or small disadvantaged businesses to receive the subcontract award.

d. Records to support such efforts as:

(i) contacts with disadvantaged and small business trade associations;

(ii) contacts with business development organizations; and

(iii) attendance at small and disadvantaged business procurement conferences and trade fairs.

e. Records to support internal activities to guide and encourage buyers such as:

(i) workshops, seminars, training programs, etc.;

and

(ii) monitoring activities to evaluate compliance.

f. On a contract-by-contract basis, records to support award data submitted to the Government to include name, address, and size status of subcontractor.

(c) In order to effectively implement this plan, the Contractor shall:

(1) Issue and promulgate company-wide policy statements in support of this effort, develop written procedures and work instructions, and assign specific responsibilities regarding the requirements of this clause.

(2) Demonstrate continuing management interest and involvement in support of these programs through such actions as regular reviews of progress and establishment of overall corporate and divisional goals and objectives.

(3) Train and motivate Contractor personnel in support of these programs.

(4) Assist small business and small disadvantaged business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business and disadvantaged subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(5) Provide adequate and timely consideration of the potentialities of small business and small disadvantaged business concerns in all "make-or-buy" decisions.

(6) Counsel and discuss subcontracting opportunities with representatives of small and disadvantaged business firms as are referred by the Small and Disadvantaged Business Utilization Specialist responsible for monitoring performance under this program and representatives of the SBA.

(d) The Contractor shall submit SF 295 in accordance with instructions provided on the form.

(e) The bidder understands that:

(1) Prior compliance of the bidder with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the bidder for award of the contract.

(2) The failure of any Contractor or subcontractor to comply in good faith with (i) the clause entitled "Utilization of Small Business and Small Disadvantaged Business Concerns", or (ii) the terms of any subcontracting plan required by this "Small Business and Small Disadvantaged Business Subcontracting Plan (Advertised)" provision, will be a material breach of the contract or subcontract.

(f) In the acquisition of commercial products, the bidder further understands that:

(1) If a commercial product (defined below) is offered, the required subcontracting plan may cover the company's production generally, both for Government contracts and for regular commercial sales, rather than just this acquisition. In such cases, the Contractor may request approval from the Contracting Officer to submit one company-wide, or division-wide, annual plan. If such request is deemed appropriate, the offeror shall submit a proposed company-wide, or division-wide, annual plan for acceptance.

(2) Upon approval by the Contracting Officer, the plan will remain in effect for the company's entire fiscal year. During this period, Government contracts for commercial products of the affected company or division will not be required to contain individual subcontracting plans relating only to the supply or services being acquired, unless the Contracting Officer determines for a particular contract that there are unforeseen possibilities for small business and small disadvantaged business subcontracting.

(3) At least 60 days before the scheduled termination of the company or division-wide plan, the Contractor may submit to the Contracting Officer a proposed company or division-wide subcontracting plan for its commercial products for the succeeding fiscal year. If the plan would

otherwise terminate prior to approval of the succeeding fiscal year's plan, it will remain in effect until the succeeding plan is accepted or rejected, but no longer than 60 days after the end of the company's fiscal year.

(4) For the purpose of this program, the term "commercial product" means a product in regular production sold in substantial quantities to the general public and/or industry at established catalog or market prices. A product which, in the opinion of the Contracting Officer, differs only insignificantly from the Contractor's commercial product may be regarded for the purpose of this clause as a commercial product. (DAR 7-104.14(c))

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

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

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed hereunder, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

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

#### 43. AUTHORIZATION AND CONSENT (1964 MAR)

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

#### 44. COMPOSITION OF CONTRACTOR (1965 JAN)

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

#### 45. SITE INVESTIGATION (1965 JAN)

The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those

bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from information presented by the drawings and specifications made a part of this contract. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the Government. (DAR 7-602.33)

#### 46. PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS (1965 JAN)

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

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

#### 47. OPERATIONS AND STORAGE AREAS (1965 JAN)

(a) All operations of the Contractor (including storage of materials) upon Government premises shall be confined to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by his operations.

(b) Temporary buildings (storage sheds, shops, offices, etc.) may be erected by the Contractor only with the approval of the Contracting Officer, and shall be built with labor and materials furnished by the Contractor without expense to the Government. Such temporary buildings and utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the work. With the written consent of the Contracting Officer, such buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways or construct and use such temporary roadways as may be authorized by the Contracting Officer. Where materials are transported in the prosecution of the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or

prescribed by any Federal, State or local law or regulation. When it is necessary to cross curbs or sidewalks, protection against damage shall be provided by the Contractor and any damaged roads, curbs, or sidewalks shall be repaired by, or at the expense of the Contractor. (DAR 7-602.35)

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

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

#### 49. SUBCONTRACTORS (1979 MAR)

(In construction contracts to be performed in United States possessions (as defined in DAR 18-703.2) and in Puerto Rico, the second sentence is modified to refer only to the clauses required by DAR 18-703.2)

Within seven days after the award of any subcontract either by himself or a subcontractor, the Contractor shall deliver to the Contracting Officer a completed DD Form 1566. The form shall include the subcontractor's acknowledgement of the inclusion in his subcontract of the clauses of this contract entitled "Davis-Bacon Act," "Contract Work Hours and Safety Standards Act-Overtime Compensation," "Apprentices and Trainees," "Compliance with Copeland Regulations," "Withholding of Funds," "Subcontracts," "Contract Termination-Debarment," and "Payrolls and Basic Records." Nothing contained in this contract shall create any contractual relation between the subcontractor and the Government. (DAR 7-602.37)

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

The Contractor shall at all times keep the construction area, including storage areas used by him, free from accumulations of waste material or rubbish and prior to completion of the work remove any rubbish from the premises and all tools, scaffolding, equipment, and materials not the property of the Government. Upon completion of the construction the Contractor shall leave the work and premises in a clean, neat and workmanlike condition satisfactory to the Contracting Officer. (DAR 7-602.40)

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

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

(b) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word

"provided" as used herein shall be understood to mean "provided complete in place," that is "furnished and installed." (DAR 7-602.41)

## 52. ACCIDENT PREVENTION

(a) In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract, the Contractor shall comply with all pertinent provisions of Corps of Engineers Manual, EM 385-1-1, dated April 1981, entitled "Safety and Health Requirements Manual", as amended, and will also take or cause to be taken such additional measures as the Contracting Officer may determine to be reasonably necessary for the purpose.

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

(c) The Contracting Officer will notify the Contractor of any noncompliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

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

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

- (1) submit in writing his proposals for effectuating this provision for accident prevention;
- (2) meet in conference with representatives of the Contracting Officer to discuss and develop mutual understandings relative to administration of the over-all safety program. (DAR 7-602.42(a) & (b))

## 53. GOVERNMENT INSPECTORS (1965 JAN)

The work will be conducted under the general direction of the Contracting Officer and is subject to inspection by his appointed inspectors to insure strict compliance with the terms of the contract. No inspector is authorized to change any provision of the specifications without written authorization of the Contracting Officer, nor shall the presence or absence of an inspector relieve the Contractor from any requirements of the contract. (DAR 7-602.43)

## 54. RIGHTS IN SHOP DRAWINGS (1966 APR)

(Applicable to all contracts calling for the delivery of shop drawings)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower tier subcontractor pursuant to a construction contract, showing in detail (i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier. (DAR 7-602.47)

55. AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (1976 JUL)

(This clause is applicable pursuant to 41 C.F.R. 60-250, if this contract is for \$10,000 or more.)

(a) The Contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability or veterans status in all employment practices such as the following: employment upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(b) The Contractor agrees that all suitable employment openings of the Contractor which exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract and including those occurring at an establishment of the Contractor other than the one wherein the contract is being performed but excluding those of independently operated corporate affiliates, shall be listed at an appropriate local office of the State employment service system wherein the opening occurs. The Contractor further agrees to provide such reports to such local office regarding employment openings and hires as may be required.

State and local government agencies holding Federal contracts of \$10,000 or more shall also list all their suitable openings with the appropriate office of the State employment service, but are not required to provide those reports set forth in paragraphs (d) and (e).

(c) Listing of employment openings with the employment service system pursuant to this clause shall be made at least concurrently with the use of any other recruitment source or effort and shall involve the normal obligations which attach to the placing of a bona fide job order, including the acceptance of referrals of veterans and nonveterans. The listing of employment openings does not require the hiring of any particular job applicant or from any particular group of job applicants, and nothing herein is intended to relieve the Contractor from any requirements in Executive Orders or regulations regarding nondiscrimination in employment.

(d) The reports required by paragraph (b) of this clause shall include, but not be limited to, periodic reports which shall be filed at least quarterly with the appropriate local office or, where the Contractor has more than one hiring location in a State, with the central office of that State employment service. Such reports shall indicate for each hiring location (1) the number of individuals hired during the reporting period, (2) the number of nondisabled veterans of the Vietnam era hired, (3) the number of disabled veterans of the Vietnam era hired, and (4) the total number of disabled veterans hired. The reports should include covered veterans hired for on-the-job training under 38 U.S.C. 1787. The Contractor shall submit a report within 30 days after the end of each reporting period wherein any performance is made on this contract identifying data for each hiring location. The Contractor shall maintain at each hiring location copies of the reports submitted until the expiration of one year after final payment under the contract, during which time these reports and related documentation shall

be made available, upon request, for examination by any authorized representatives of the Contracting Officer or of the Secretary of Labor. Documentation would include personnel records respecting job openings, recruitment and placement.

(e) Whenever the Contractor becomes contractually bound to the listing provisions of this clause, it shall advise the employment service system in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these provisions and has so advised the State system, there is no need to advise the State system of subsequent contracts. The Contractor may advise the State system when it is no longer bound by this contract clause.

(f) This clause does not apply to the listing of employment openings which occur and are filled outside of the 50 States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands.

(g) The provisions of paragraphs (b), (c), (d) and (e) of this clause do not apply to openings which the Contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement. This exclusion does not apply to a particular opening once an employer decides to consider applicants outside of his own organization or employer-union arrangement for that opening.

(h) As used in this clause:

(1) "All suitable employment openings" includes, but is not limited to, openings which occur in the following job categories: production and nonproduction; plant and office; laborers and mechanics; supervisory and nonsupervisory; technical; and executive, administrative, and professional openings as are compensated on a salary basis of less than \$25,000 per year. This term includes full-time employment, temporary employment of more than three (3) days duration, and part-time employment. It does not include openings which the Contractor proposes to fill from within his own organization or to fill pursuant to a customary and traditional employer-union hiring arrangement nor openings in an educational institution which are restricted to students of that institution. Under the most compelling circumstances an employment opening may not be suitable for listing, including such situations where the needs of the Government cannot reasonably be otherwise supplied, where listing would be contrary to national security, or where the requirement of listing would otherwise not be for the best interest of the Government.

(2) "Appropriate office of the State employment service system" means the local office of the Federal-State national system of public employment offices with assigned responsibility for serving the area where the employment opening is to be filled, including the District of Columbia, Guam, Puerto Rico, and the Virgin Islands.

(3) "Openings which the Contractor proposes to fill from within his own organization" means employment openings for which no consideration will be given to persons outside the Contractor's organization (including any affiliates, subsidiaries, and the parent companies) and includes any openings which the Contractor proposes to fill from regularly established "recall" lists.

(4) "Openings which the Contractor proposes to fill pursuant to a customary and traditional employer-union hiring arrangement" means employment openings which the Contractor proposes to fill from union halls, which is part of the customary and traditional hiring relationship which exists between the Contractor and representatives of his employees.

(i) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Vietnam Era Veterans' Readjustment Assistance Act, hereinafter referred to as the "Act" (38 U.S.C. 2012).

(j) In the event of the Contractor's noncompliance with the requirements of this clause, actions for noncompliance may be taken in accordance with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(k) The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, Office of Federal Contract Compliance Programs, provided by or through the Contracting Officer. Such notice shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era for employment, and the rights of applicants and employees.

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

(m) The Contractor will include the provisions of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance. (DAR 7-103.27)

#### 56. VALUE ENGINEERING INCENTIVE--CONSTRUCTION (1980 DEC)

(The following clause is applicable if this contract is in excess of \$100,000)

(a) Applicability. This clause applies to any Contractor developed, prepared, and submitted Value Engineering Change Proposal (VECP).

(b) Definitions.

(1) "Contractor's development and implementation costs" means those costs incurred on a VECP before Government acceptance and those costs the Contractor incurs specifically to make the changes required by Government acceptance of a VECP.

(2) "Government costs" means those agency costs that result directly from developing and implementing the VECP and any net increases in the cost of testing, operations, maintenance, and logistic support. They do not include the normal administrative costs of processing the VECP.

(3) "Instant contract savings" means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs (including subcontractor's development and implementation costs). (See paragraph (g).)

(4) "Value Engineering Change Proposal (VECP)" means a proposal that:

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

(ii) results in reducing the contract price or estimated cost without impairing essential functions or characteristics, provided that it does not involve a change in deliverable end-item quantities only.

(c) VECP Preparation. As a minimum, the Contractor shall include the information described in (1) through (6) in each VECP. If the proposed change affects contractually required configuration management procedures, the instructions in the procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.

(2) A list of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) A separate, detailed cost estimate for both the affected portions of the existing contract requirement and the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (g). The Contractor shall also include a description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(4) A projection of any effects the proposed change would have on collateral costs to the agency.

(5) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(6) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submissions.

(1) The Contractor shall submit VECPs to the Resident Engineer at the worksite, with a copy to the Contracting Officer. The Contracting Officer shall notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required because of extenuating circumstances, the Contractor shall be notified within the 45-day period and provided the reason for the delay and the expected date of the Contracting Officer's decision. VECPs shall be processed expeditiously; however, the Government shall not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer shall provide the Contractor written notification fully explaining the reasons for rejection. The Contractor may withdraw, in whole or in part, any VECP not accepted by the Government within the period specified in the VECP. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(e) Acceptance. Any VECP may be accepted in whole or in part by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The Contracting Officer's decision to accept all or part of any VECP shall be final and not subject to the Disputes clause.

(f) Sharing.

(1) Rates. The Contractor's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by 55 percent for fixed-price contracts and 25 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to:

- (i) accept the VECP;
- (ii) reduce the contract price or estimated cost by the amount of instant contract savings; and
- (iii) provide the Contractor's share of savings by adding the amount calculated in (f)(1) to the contract price or fee.

(g) Subcontract. The Contractor shall include appropriate VE clauses in an subcontract of \$50,000 or more and may include them in subcontracts of lesser value. To compute any adjustment in the contract price under paragraph (f), the Contractor's VECP development and implementation costs shall include any subcontractor's development and implementation costs that clearly result from the VECP, but shall exclude any VE incentive payments to subcontractors. The Contractor may choose any arrangement for subcontractor VE incentive payments, provided that these payments are not made from the Government's share of the savings resulting from the VECP.

(h) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering Incentive--Construction clause of Contract \_\_\_\_\_, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a VECP submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (DAR 7-602.50)

#### 57. AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS (1976 MAY)

(Contracts and subcontracts are exempt from the requirements of the following clause with regard to work performed outside the United States by employees who were not recruited within the United States.)

(a) The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant for employment is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices such as the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(b) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(c) In the event of the Contractor's noncompliance with the requirements of this clause, action for noncompliance may be taken in accordance with the rules, regulations and relevant orders of the Secretary of Labor issued pursuant to the Act.

(d) The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices in a form to be prescribed by the Director, provided by or through the Contracting Officer. Such notices shall state the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified handicapped employees and applicants for employment, and the rights of applicants and employees.

(e) The Contractor will notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of section 503 of the Rehabilitation Act of 1973, and is committed to take affirmative action to employ and advance in employment physically and mentally handicapped individuals.

(f) The Contractor will include the provisions of this clause in every subcontract or purchase order of \$2,500 or more unless exempted by rules, regulations, or orders of the Secretary issued pursuant to section 503 of the Act, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Director of the Office of Federal Contract Compliance Programs may direct to enforce such provisions, including action for noncompliance. (DAR 7-103.28)

#### 58. CLEAN AIR AND WATER (1975 OCT)

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

(a) The Contractor agrees as follows:

(i) To comply with all the requirements of section 114 of the Clean Air Act, as amended (42 U.S.C. 1857, et seq., as amended by Public Law 91-604) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251, as amended by Public Law 92-500), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, respectively, and all regulations and guidelines issued thereunder before the award of this contract;

(ii) That no portion of the work required by this prime contract will be performed in a facility listed on the Environmental Protection Agency List of Violating Facilities on the date this contract was awarded unless and until the EPA eliminates the name of such facility or facilities from such listing;

(iii) To use his best efforts to comply with clean air standards and clean water standards at the facilities in which the contract is being performed; and

(iv) To insert the substance of the provisions of this clause in any nonexempt subcontract, including this paragraph (iv).

(b) The terms used in this clause have the following meanings.

(i) The term "Air Act" means the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Public Law 91-604).

(ii) The term "Water Act" means Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Public Law 92-500).

(iii) The term "clean air standards" means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110(d) of the Clean Air Act (42 U.S.C. 1857c-5(d), an approved implementation procedure or plan under section 111(c) or section 111(d), respectively, of the Air Act (42 U.S.C. 1857c-6(c) or (d)), or an approved implementation procedure under section 112(d) of the Air Act (42 U.S.C. 1857c-7(d)).

(iv) The term "clean water standards" means any enforceable limitation, control, condition, prohibition, standard or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. 1342), or by a local government to ensure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. 1317)

(v) The term "compliance" means compliance with clean air or water standards. Compliance shall also mean compliance with a schedule or plan ordered or approved by a court of competent jurisdiction, the Environmental Protection Agency or an air or water pollution control agency in accordance with the requirement of the Air Act or Water Act and regulations issued pursuant thereto.

(vi) The term "facility" means any building, plant, installation, structure, mine, vessel or other floating craft, location, or site of operations, owned, leased, or supervised by a contractor, subcontractor, to be utilized in the performance of a contract or subcontract. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location or site shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

(vii) The term "nonexempt contract or subcontract" means a contract or subcontract of more than \$100,000 which is not otherwise exempted pursuant to the EPA regulations implementing the Air Act and Water Act (40 CFR 15.5), as further implemented in DAR 1-2302.4 or in FPR 1-1.2302-4 (whichever is applicable) and the procedures of the Department awarding the contract. (DAR 7-103.29)

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

(a) Whenever the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Contracting Officer.

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

60. CONTRACT PRICES - BIDDING SCHEDULE (1968 APR)

(The following clause is applicable to contracts containing unit prices)

Payment for the various items listed in the Bidding Schedule shall constitute full compensation for furnishing all plant, labor, equipment, appliances, and materials, and for performing all operations required to complete the work in conformity with the drawings and specifications. All costs for work not specifically mentioned in the Bidding Schedule shall be included in the contract prices for the items listed. (DAR 7-603.5)

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

(The following clause is applicable to rateable contracts)

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

62. PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA - PRICE ADJUSTMENT (1970 JAN)

(The following clause is applicable if this contract is in excess of \$100,000)

(a) This clause shall become operative only with respect to any modification of this contract which involves aggregate increases and/or decreases in costs plus applicable profits in excess of \$100,000 unless the modification is priced on the basis of adequate competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation. The right to price reduction under this clause is limited to defects in data relating to such modification.

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

- (i) the Contractor furnished cost or pricing data which was not complete, accurate and current as certified in the Contractor's Certificate of Current Cost or Pricing Data;
- (ii) a subcontractor, pursuant to the clause of this contract entitled "Subcontractor Cost or Pricing Data" or "Subcontractor Cost or Pricing Data - Price Adjustments" or any subcontract clause therein required, furnished cost or pricing data which was not complete, accurate and current as certified in the subcontractor's Certificate of Current Cost or Pricing Data;
- (iii) a subcontractor or prospective subcontractor furnished cost or pricing data which was required to be complete, accurate and current and to be submitted to support a subcontract cost estimate furnished by the Contractor but which was not complete, accurate and current as of the date certified in the Contractor's Certificate of Current Cost or Pricing Data; or
- (iv) the Contractor or a subcontractor or prospective subcontractor furnished any data, not within (i), (ii) or (iii) above, which was not accurate, as submitted;

the price shall be reduced accordingly and the contract shall be modified in writing as may be necessary to reflect such reduction. However, any reduction in the contract price due to defective subcontract data of a prospective subcontractor, when the subcontract was not subsequently awarded to such subcontractor, will be limited to the amount (plus applicable overhead and profit markup) by which the actual subcontract, or actual cost to the

Contractor if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor, provided the actual subcontract price was not affected by defective cost or pricing data.

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

#### 63. INTEREST (1972 MAY)

Notwithstanding any other provision of this contract, unless paid within thirty (30) days, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code) shall bear interest from the date due until paid and shall be subject to adjustments as provided by Part 6 of Appendix E of the Defense Acquisition Regulation, as in effect on the date of this contract. The interest rate per annum shall be the interest rate in effect which has been established by the Secretary of the Treasury pursuant to Public Law 92-41; 85 STAT 97 for the Renegotiation Board, as of the date the amount becomes due as herein provided. Amounts shall be due upon the earliest one of (i) the date fixed pursuant to this contract; (ii) the date of the first written demand for payment, consistent with this contract, including demand consequent upon default termination; (iii) the date of transmittal by the Government to the Contractor of a proposed supplemental agreement to confirm completed negotiations fixing the amount; or (iv) if this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or in connection with a negotiated pricing agreement not confirmed by contract supplement. (DAR 7-104.39)

#### 64. AUDIT BY DEPARTMENT OF DEFENSE (1978 AUG)

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

(a) General. The Contracting Officer or his representatives shall have the audit and inspection rights described in the applicable paragraphs (b), (c) and (d) below.

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

(c) Cost or Pricing Data. If the Contractor submitted cost or pricing data in connection with the pricing of this contract or any change or modification thereto, unless such pricing was based on adequate price

competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation, the Contracting Officer or his representatives who are employees of the United States Government shall have the right to examine all books, records, documents and other data of the Contractor related to the negotiation, pricing or performance of such contract, change or modification, for the purpose of evaluating the accuracy, completeness and currency of the cost or pricing data submitted. Additionally, in the case of pricing any change or modification exceeding \$100,000 to formally advertised contracts, the Comptroller General of the United States or his representatives who are employees of the United States Government shall have such rights. The right of examination shall extend to all documents necessary to permit adequate evaluation of the cost or pricing data submitted, along with the computations and projections used therein.

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

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

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

(2) Records which relate to appeals under the "Disputes" clause of this contract, or litigation or the settlement of claims arising out of the performance of this contract, shall be made available until such appeals, litigation, or claims have been disposed of.

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

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

(The following clause is applicable if this contract is in excess of \$100,000)

(a) Paragraphs (b) and (c) of this clause shall become operative only with respect to any modification made pursuant to one or more provisions of this contract which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000. The requirements of this clause shall be limited to such modifications.

(b) The Contractor shall require subcontractors hereunder to submit cost or pricing data under the following circumstances: (i) prior to the award of any subcontract the amount of which is expected to exceed \$100,000 when entered into; (ii) prior to the pricing of any subcontract modification which involves aggregate increases and/or decreases in costs plus applicable profits expected to exceed \$100,000; except where the price is based on adequate price

competition, established catalog or market prices of commercial items sold in substantial quantities to the general public, or prices set by law or regulation.

(c) The Contractor shall require subcontractors to certify that to the best of their knowledge and belief the cost and pricing data submitted under (b) above is accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract change or modification.

(d) The Contractor shall insert the substance of this clause including this paragraph (d) in each subcontract which exceeds \$100,000. (DAR 7-104.42(b))

#### 66.1 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (1964 NOV)

(The following clause is applicable when Government Property having an acquisition cost of \$50,000 or less is furnished to or acquired by the Contractor)

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

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

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

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

#### 66.2 GOVERNMENT PROPERTY (FIXED PRICE) (1968 SEP)

(The following clause is applicable when Government Property having an acquisition cost in excess of \$50,000 is furnished to or acquired by the Contractor)

(a) Government-Furnished Property. The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the property described as Government-furnished property in the Schedule or specifications, together with such related data and information as the Contractor may request and as may reasonably be required for the intended use of such property (hereinafter referred to as "Government-furnished property"). The delivery or performance dates for the supplies or services to be furnished by the Contractor under this contract are based upon the expectation that Government-furnished property suitable for use (except for such property furnished "as is") will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to

enable the Contractor to meet such delivery or performance dates. In the event that Government-furnished property is not delivered to the Contractor by such time or times, the Contracting Officer shall, upon timely written request made by the Contractor, make a determination of the delay, if any, occasioned the Contractor thereby, and shall equitably adjust the delivery or performance dates or the contract price, or both, and any other contractual provision affected by any such delay, in accordance with the procedures provided for in the clause of this contract entitled "Changes." Except for Government-furnished property furnished "as is," in the event the Government-furnished property is received by the Contractor in a condition not suitable for the intended use the Contractor shall, upon receipt thereof, notify the Contracting Officer of such fact and, as directed by the Contracting Officer, either (i) return such property at the Government's expense or otherwise dispose of the property, or (ii) effect repairs or modifications. Upon the completion of (i) or (ii) above, the Contracting Officer upon written request of the Contractor shall equitably adjust the delivery or performance dates or the contract price, or both, and any other contractual provision affected by the rejection or disposition, or the repair or modification, in accordance with the procedures provided for in the clause of this contract entitled "Changes." The foregoing provisions for adjustment are exclusive and the Government shall not be liable to suit for breach of contract by reason of any delay in delivery of Government-furnished property or delivery of such property in a condition not suitable for its intended use.

(b) Changes in Government-furnished Property.

- (1) By notice in writing, the Contracting Officer may (i) decrease the property provided or to be provided by the Government under this contract, or (ii) substitute other Government-owned property for property to be provided by the Government, or to be acquired by the Contractor for the Government, under this contract. The Contractor shall promptly take such action as the Contracting Officer may direct with respect to the removal and shipping of property covered by such notice.
- (2) In the event of any decrease in or substitution of property pursuant to subparagraph (1) above, or any withdrawal of authority to use property provided under any other contract or lease, which property the Government had agreed in the Schedule to make available for the performance of this contract, the Contracting Officer, upon the written request of the Contractor (or, if the substitution of property causes a decrease in the cost of performance, on his own initiative), shall equitably adjust such contractual provisions as may be affected by the decrease, substitution, or withdrawal, in accordance with the procedures provided for in the "Changes" clause of this contract.

(c) Title. Title to all property furnished by the Government shall remain in the Government. In order to define the obligations of the parties under this clause, title to each item of facilities, special test equipment, and special tooling (other than that subject to a "Special Tooling" clause) acquired by the Contractor for the Government pursuant to this contract shall pass to and vest in the Government when its use in the performance of this contract commences, or upon payment therefor by the Government, whichever is earlier, whether or not title previously vested. All Government-furnished property, together with all property acquired by the Contractor title to which vests in the Government under this paragraph, is subject to the provisions of this clause and is hereinafter collectively referred to as "Government

property." Title to Government property shall not be affected by the incorporation or attachment thereof to any property not owned by the Government, nor shall such Government property, or any part thereof, be or become a fixture or lose its identity as personalty by reason of affixation to any realty.

(d) Property Administration. The Contractor shall comply with the provisions of Appendix B, Defense Acquisition Regulation, as in effect on the date of the contract, which is hereby incorporated by reference and made a part of this contract. Material to be furnished by the Government shall be ordered or returned by the Contractor, when required, in accordance with the "Manual for Military Standard Requisitioning and Issue Procedure (MILSTRIP) for Defense Contractors" (Appendix H, Defense Acquisition Regulation) as in effect on the date of this contract, which Manual is hereby incorporated by reference and made a part of this contract.

(e) Use of Government Property. The Government property shall, unless otherwise provided herein or approved by the Contracting Officer, be used only for the performance of this contract.

(f) Utilization, Maintenance and Repair of Government Property. The Contractor shall maintain and administer, in accordance with sound industrial practice, and in accordance with applicable provisions of Appendix B, a program for the utilization, maintenance, repair, protection, and preservation of Government property until disposed of by the Contractor in accordance with this clause. In the event that any damage occurs to Government property the risk of which has been assumed by the Government under this contract, the Government shall replace such items or the Contractor shall make such repair of the property as the Government directs; provided however, that if the Contractor cannot effect such repair within the time required, the Contractor shall dispose of such property in the manner directed by the Contracting Officer. The contract price includes no compensation to the Contractor for the performance of any repair or replacement for which the Government is responsible, and an equitable adjustment will be made in any contractual provisions affected by such repair or replacement of Government property made at the direction of the Government, in accordance with the procedures provided for in the "Changes" clause of this contract. Any repair or replacement for which the Contractor is responsible under the provisions of this contract shall be accomplished by the Contractor at his own expense.

(g) Risk of Loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss of or damage to Government property provided under this contract upon its delivery to him or upon passage of title thereto to the Government as provided in paragraph (c) hereof, except for reasonable wear and tear and except to the extent that such property is consumed in the performance of this contract.

(h) Access. The Government, and any persons designated by it, shall at all reasonable times have access to the premises wherein any Government property is located, for the purpose of inspecting the Government property.

(i) Final Accounting and Disposition of Government Property. Upon the completion of this contract, or at such earlier dates as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government property not consumed in the performance of this contract (including any resulting scrap) or not theretofore delivered to the Government, and shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid in such other manner as the Contracting Officer may direct.

(j) Restoration of Contractor's Premises and Abandonment. Unless otherwise provided herein, the Government:

- (i) may abandon any Government property in place, and thereupon all obligations of the Government regarding such abandoned property shall cease; and
- (ii) has no obligation to the Contractor with regard to restoration or rehabilitation of the Contractor's premises, neither in case of abandonment (paragraph (j)(i) above), disposition on completion of need or of the contract (paragraph (i) above), nor otherwise, except for restoration or rehabilitation costs which are properly included in an equitable adjustment under paragraph (b) above.

(k) Communications. All communications issued pursuant to this clause shall be in writing or in accordance with the "Manual for Military Standard Requisitioning and Issue Procedure (MILSTRIP) for Defense Contractors" (Appendix H, Defense Acquisition Regulation). (DAR 7-104.24(a))

#### 67. VARIATIONS IN ESTIMATED QUANTITIES (1968 APR)

(The following clause is not applicable to bid items listed in the "Variations in Estimated Quantities - Subdivided Items" clause, and also is not applicable to contracts for dredging work which contain the "Variations in Estimated Quantities - Dredging" clause.)

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

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

(a) The Contractor shall within 5 days or within such time as determined by the Contracting Officer, after date of commencement of work, prepare and submit to the Contracting Officer for approval a practicable schedule, showing the order in which the Contractor proposes to carry on the work, the date on which he will start the several salient features (including procurement of materials, plant and equipment) and the contemplated dates for completing the same. The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion at any time. The Contractor shall enter on the chart the actual progress at such intervals as directed by the Contracting Officer, and shall immediately deliver to the Contracting Officer three copies thereof. If the Contractor fails to submit a progress schedule within the time herein prescribed, the Contracting Officer may withhold approval of progress payment estimates until such time as the Contractor submits the required progress schedule.

(b) If, in the opinion of the Contracting Officer, the Contractor falls behind the progress schedule, the Contractor shall take such steps as may be necessary to improve his progress and the Contracting Officer may require him

to increase the number of shifts, or overtime operations, days of work, or the amount of construction plant, or all of them, and to submit for approval such supplementary schedule or schedules in chart form as may be deemed necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to the Government.

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

69. CERTIFICATION OF REQUESTS FOR ADJUSTMENT OR RELIEF EXCEEDING \$100,000 (1980 FEB)

(The following clause is applicable if this contract is expected to exceed \$100,000 and the procurement instrument identification number is prefixed by the letters "DACA")

(a) Any contract claim, request for equitable adjustment to contract terms, request for relief under Public Law 85-804, or other similar request exceeding \$100,000 shall bear, at the time of submission, the following certificate given by a senior company official in charge at the plant or location involved:

I certify that the claim is made in good faith, that the supporting data are accurate and complete to the best of my knowledge and belief; and that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable.

\_\_\_\_\_  
(Official's Name)

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

(b) The certification in paragraph (a) requires full disclosure of all relevant facts, including cost and pricing data.

(c) The certification requirement in paragraph (a) does not apply to:

(i) requests for routine contract payments--for example, those for payment for accepted supplies and services, routine vouchers under cost reimbursement-type contracts and progress payment invoices;

(ii) final adjustments under incentive provisions of contracts;

(d) In those situations where no claim certification for the purposes of Section 813 has been submitted prior to the inception of a contract dispute, a single certification, using the language prescribed by the Contract Disputes Act but signed by a senior company official in charge at the plant or location involved, will be deemed to comply with both statutes. (DAR 7-104.102)

70. AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (1978 SEP)

(a) As used in this clause:

(1) "Covered area" means the geographical area described in the solicitation from which this contract resulted;

(2) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

(3) "Employer identification number" means the Federal social security number used on the employer's quarterly federal tax return, U.S. Treasury Department Form 941.

(4) "Minority" includes:

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

(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);

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

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

(b) Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of this clause and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitation from which this contract resulted.

(c) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan, in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals.

(d) The Contractor shall implement the specific affirmative action standards provided in subparagraphs (g)(1) through (16) of this clause. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work (whether or not it is Federal or Federally assisted) in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where such work is actually performed. The Contractor is expected to make substantially uniform progress toward its goal in each craft.

(e) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, or the regulations promulgated pursuant thereto.

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

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

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

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

(3) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

(4) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

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

(6) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority

and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

(7) Review, at least annually, the company's EEO policy and affirmative action obligations under this clause with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.

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

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

(11) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

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

(13) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under this clause are being carried out.

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

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

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

(h) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations ((g)(1) through (16)). The efforts of a contractor association, joint contractor-union, contractor-community, or other

similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under (g)(1) through (16) of this clause provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

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

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of this clause and Executive Order 11246, as amended.

(m) The Contractor, in fulfilling its obligations under this clause shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or this clause, the Director shall proceed in accordance with 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

(o) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program). (DAR 7-603.60)

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

(a) It is the policy of the United States Government that women-owned businesses shall have the maximum practicable opportunity to participate in the performance of contracts awarded by any Federal agency.

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

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

72. ENVIRONMENTAL LITIGATION (1974 NOV)(OCE)

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment. (ECI 7-671.10)



AREA and ZONE DEFINITIONS

ASBESTOS WORKERS:

- Zone 1: Area lying within 15 miles radius from the City Hall in Phoenix or Tucson
- Zone 2: Area lying beyond the limits of Zone 1 and within 30 miles radius from the City Hall in Phoenix or Tucson
- Zone 3: Area lying beyond the limits of Zone 2 and within 40 miles radius from the City Hall in Phoenix or Tucson
- Zone 4: Area lying beyond the limits of Zone 3 and within 50 miles radius from the City Hall in Phoenix or Tucson
- Zone 5: Area lying beyond the limits of Zone 4

BRICKLAYERS; STONEMASONS:

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

- ZONE A: 0-35 road miles from the City Hall in Phoenix
- ZONE B: 35-50 road miles from the City Hall in Phoenix
- ZONE C: 50-75 road miles from the City Hall in Phoenix
- ZONE D: 75-100 road miles from the City Hall in Phoenix
- ZONE E: 100-200 road miles from the City Hall in Phoenix
- ZONE F: 200 road miles and over from the City Hall in Phoenix

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

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

RW-2

CARPENTERS:\*

- Northern Area:
  - Carpenters; Drywall
  - Applicator; Saw Filer;
  - Shingler
  - Floorlayers (finish);
  - Piledrivermen
  - Millwrights
- Central and Southern Areas:
  - Carpenters; Saw Filers
  - Floorlayers (finish);
  - Piledrivermen
  - Millwrights

CEMENT MASONS:\*

- Zone 1:
  - Northern Area:
    - Cement Masons
    - Concrete Troweling Machine; Sawing and Scoring Machine; Curb and Gutter Machine
  - Central & Southern Areas:
    - Cement Masons
    - Concrete Troweling Machine; Sawing and Scoring Machine; Curb and Gutter Machine
- Zone 2:
  - Cement Masons
  - Concrete Troweling Machine; Sawing and Scoring Machine; Curb and Gutter Machine;
  - Clary and similar type of power screed Operator

DRYWALL TAPERS:\*

- Zone A
- Zone B
- Zone C

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and/or Appr. Tr.
\$15.06	1.335	\$1.115		.08
15.405	1.335	1.115		.08
15.565	1.335	1.115		.08
12.935	1.335	1.115		.08
13.28	1.335	1.115		.08
13.44	1.335	1.115		.08
15.035	.95	1.40		.05
15.225	.95	1.40		.05
12.91	.95	1.40		.05
13.10	.95	1.40		.05
12.84	1.12	1.30		.05
13.03	1.12	1.30		.05
13.30	.60	.50		.10
14.30	.60	.50		.10
15.80	.60	.50		.10

\*See AREA and ZONE Descriptions - Page 4



## AREA and ZONE DEFINITIONS

## ELECTRICIANS:

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

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

- Zone A: 5 miles north-south, east and west of the Post Offices of Williams, Sedona, and Winslow  
 Zone B: Remainder of Area 2 not covered by Zone A

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

- Zone A: Area within 16 road miles beginning where the Southern Pacific Railroad intersects Highway 60-70 at Kaiser Crossing; Area within 12 miles radius from the school in Lakeside, Arizona  
 Zone B: Area within 16-28 road miles from point where the Southern Pacific Railroad intersects Highway 60-70 at Kaiser Crossing  
 Zone C: Area within 28-46 road miles from point where the Southern Pacific Railroad intersects Highway 60-70 at Kaiser Crossing  
 Zone D: Area 46 road miles and over from point where the Southern Pacific Railroad intersects Highway 60-70 at Kaiser Crossing; Area over 12 miles radius from school in Lakeside, Arizona

RW-4

## AREA and ZONE DEFINITIONS (Cont'd)

## ELECTRICIANS: (Cont'd)

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

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

- Zone A: Area within 16 miles radius from the City Hall in Tucson or Yuma; Area within 16 road miles from center of Town in Douglas, Nogales or Sierra Vista; Area within the boundaries of the incorporated city limits of Parker, plus an area extending from the south city limits of Parker in a northeasterly direction to Milepost No. 150 located on State Highway #95, northeast of Parker from the Colorado River on the west, an area 1 mile wide paralleling the Colorado River  
 Zone B: Area lying beyond the limits of Zone A extending to and including 12 road miles excluding area near Douglas, Nogales and Sierra Vista  
 Zone C: Area lying beyond the limits of Zone B extending up to and including 18 road miles, excluding area near Douglas, Nogales and Sierra Vista  
 Zone D: Area lying beyond the limits of Zone C; for area near the Cities of Douglas, Nogales, Sierra Vista, the area lying beyond the limits of Zone A

	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
MARBLE WORKERS:*					
Area 1	\$13.06	.90	\$ 1.10		.19
MASON TENDERS	11.00	1.12	1.30		.06
PAINTERS:*					
Area 1:					
Zone A:					
Brush; Soft Floor Layers	11.60	.90	.80		.20
Brush, steel and bridge	12.10	.90	.80		.20
Spray	12.05	.90	.80		.20
Spray, steel and bridge	12.60	.90	.80		.20
Zone B:					
Brush; Soft Floor Layers	12.35	.90	.80		.20
Brush, steel and bridge	12.85	.90	.80		.20
Spray	12.80	.90	.80		.20
Spray, steel and bridge	13.35	.90	.80		.20
Zone C:					
Brush; Soft Floor Layers	13.35	.90	.80		.20
Brush, steel and bridge	13.85	.90	.80		.20
Spray	13.80	.90	.80		.20
Spray, steel and bridge	14.35	.90	.80		.20
Zone D:					
Brush; Soft Floor Layers	13.60	.90	.80		.20
Brush, steel and bridge	14.10	.90	.80		.20
Spray	14.05	.90	.80		.20
Spray, steel and bridge	14.60	.90	.80		.20
Area 2:					
Zone A:					
Brush and Roller; Sandblaster (Nozzleman); Sheetrock Taper; Floor Coverer; Sandblaster (Pot Tender)	12.69	.60	.60		.10
Spray; Paperhanger	12.94	.60	.60		.10
Creosote Applier	13.02	.60	.60		.10
Swing Stage:					
Brush; Sandblaster	13.09	.60	.60		.10
Spray	13.34	.60	.60		.10
Steeplejack	13.55	.60	.60		.10

\*See AREA and ZONE Descriptions - Page 14

RM-5

	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
PAINTERS:*					
(Cont'd)					
Area 2: (Cont'd)					
Zone A: (Cont'd)					
Steel and bridge, brush; Nozzleman and Pot Tender; Steel (steam cleaner); Electric and air tool Operator; Steel Sandblaster	\$13.62	.60	.60		.10
Steel and bridge, spray	13.82	.60	.60		.10
Zone B:					
Brush and Roller; Sandblaster (Nozzleman); Sheet Rock Taper; Floor Coverer; Sandblaster (Pot Tender)	13.69	.60	.60		.10
Spray; Paperhangers	13.94	.60	.60		.10
Creosote Applier	14.02	.60	.60		.10
Swing Stage:					
Brush; Sandblaster	14.09	.60	.60		.10
Spray	14.34	.60	.60		.10
Steeplejack	14.55	.60	.60		.10
Steel and bridge, Brush; Nozzleman and Pot Tender; Steel (steam cleaner); Electric and air tool Operator; Steel Sandblaster	14.62	.60	.60		.10
Steel and bridge, Spray	14.82	.60	.60		.10
Zone C:					
Brush and Roller; Sandblaster (Nozzleman); Sheet Rock Taper; Floor Coverer; Sandblaster (Pot Tender)	15.19	.60	.60		.10
Spray; Paperhangers	15.44	.60	.60		.10
Creosote Applier	15.52	.60	.60		.10
Swing Stage:					
Brush; Sandblaster	15.59	.60	.60		.10
Spray	15.84	.60	.60		.10

\*See AREA and ZONE Descriptions - Page 14

RW-6

	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
<b>ELEVATOR CONSTRUCTORS:</b>					
Elevator Constructors	\$15.69	\$1.195	.95	a	.035
Helpers	10.98	1.195	.95	a	.035
Probationary Helpers	7.845				
<b>GLAZIERS:</b>					
Statewide excluding Bullhead City	14.71	.95	.60		.08
Bullhead City	17.02	.75	.40		.08
<b>IRONWORKERS:*</b>					
Northern Area	18.40	1.44	3.07		.11
Southern Area	15.65	1.44	3.07		.11
<b>LATHERS:*</b>					
Area 1	14.235	1.00			.06
Area 2	13.75	1.00			.06
<b>LINE CONSTRUCTION:*</b>					
<b>Zone 1:</b>					
Groundmen	12.20	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Equipment Operators; Powdermen; Mechanics; Linemen; Technicians;	14.41	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Crane Operators	16.24	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Cable Splicers	16.71	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
<b>Zone 1-A:</b>					
Groundmen	13.20	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Equipment Operators; Powdermen; Mechanics; Linemen; Technicians;	15.32	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Crane Operators	17.22	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Cable Splicers	17.79	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
<b>Zone 2:</b>					
Groundmen	14.14	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Equipment Operators; Powdermen; Mechanics; Linemen; Technicians;	16.27	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Crane Operators	18.16	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
Cable Splicers	18.68	1.00	3 $\frac{3}{4}$ +2.00		1/2 $\frac{1}{2}$
<b>MARBLE, TILE, and TERRAZZO FINISHERS</b>	11.02	1.19	.30		.10

\*See AREA and ZONE Descriptions - Page 9

APEA and ZONE DEFINITIONS

**IRONWORKERS:**  
Northern Area: Area north from a line 10 miles north of and parallel to Highway #66, North to the Arizona-Utah border and from the Arizona-California border east to the Arizona-New Mexico border

Southern Area: All areas not included in the Northern Area

**LATHERS:**  
Area 1: North of a line crossing the State drawn through Ajo, Randolph and Springerville; except as follows: northeast of a line drawn from Springerville to a point 4 miles northeast of Keams Canyon

Area 2: South of a line crossing the State drawn through Ajo, Randolph and Springerville

**LINE CONSTRUCTION:**  
Zone 1: Phoenix and Tucson 30 mile radius from the center of Town; Area within 10 mile radius from the City Hall of Yuma

Zone 1-A: Flagstaff, Globe, and Kingman; and 10 mile radius from the center of Town

Zone 2: Other Areas not covered by Zone 1 and Zone 1-A

PAINTERS:\* (Cont'd)  
 Area 2: (Cont'd)  
 Zone C: (Cont'd)  
 Steel and bridge, Brush;  
 Nozzleman and Pot Tender;  
 Steel (steam cleaner); Electric air  
 tool Operator; Steel  
 Sandblaster  
 Steel and bridge, Spray  
 Area 3:  
 Zone A:  
 Brush  
 Spray; Sandblaster  
 Paperhanger  
 Swing Stage, under 40  
 ft.:  
 Brush  
 Spray  
 Swing Stage, over 40 ft.:  
 Brush  
 Spray  
 Structural Steel and  
 Tanks:  
 Brush  
 Spray and Sandblasters  
 Zone B:  
 Brush  
 Spray and Sandblasters  
 Paperhangers  
 Swing Stage, under 40  
 ft.:  
 Brush  
 Spray  
 Swing Stage, over 40 ft.:  
 Brush  
 Spray  
 Structural Steel and  
 Tanks:  
 Brush  
 Spray and Sandblasters

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and of Appr. Tr.
\$16.12	.60	.60		.10
16.32	.60	.60		.10
11.32	.87	.50		.10
11.92	.87	.50		.10
11.45	.87	.50		.10
11.62	.87	.50		.10
12.22	.87	.50		.10
12.07	.87	.50		.10
12.67	.87	.50		.10
12.32	.87	.50		.10
12.92	.87	.50		.10
12.07	.87	.50		.10
12.67	.87	.50		.10
12.20	.87	.50		.10
12.37	.87	.50		.10
12.97	.87	.50		.10
12.82	.87	.50		.10
13.42	.87	.50		.10
13.07	.87	.50		.10
13.67	.87	.50		.10

\*See AREA and ZONE Descriptions -Page 14

RW-7

PAINTERS:\* (Cont'd)  
 Area 3: (Cont'd)  
 Zone C:  
 Brush  
 Spray  
 Paperhangers  
 Swing Stage, under 40  
 ft.:  
 Brush  
 Spray  
 Swing Stage, over 40 ft.:  
 Brush  
 Spray  
 Structural Steel and  
 Tanks:  
 Brush  
 Spray and Sandblasters  
 Zone D:  
 Brush  
 Spray  
 Paperhangers  
 Swing Stage, under 40  
 ft.:  
 Brush  
 Spray  
 Swing Stage, over 40  
 ft.:  
 Brush  
 Spray  
 Structural Steel and  
 Tanks:  
 Brush  
 Spray and Sandblasters

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and of Appr. Tr.
\$12.82	.87	.50		.10
13.42	.87	.50		.10
12.95	.87	.50		.10
13.12	.87	.50		.10
13.57	.87	.50		.10
13.22	.87	.50		.10
14.17	.87	.50		.10
13.82	.87	.50		.10
14.42	.87	.50		.10
14.07	.87	.50		.10
14.67	.87	.50		.10
14.20	.87	.50		.10
14.37	.87	.50		.10
14.97	.87	.50		.10
14.82	.87	.50		.10
15.42	.87	.50		.10
15.07	.87	.50		.10
15.67	.87	.50		.10

\*See AREA and ZONE Descriptions - Page 14

AREA and ZONE DEFINITIONS

MABLE WORKERS:

Area 1: Apache, Coconino, and Gila Counties; Graham County (west and north of San Francisco River to Gila River); Greenlee County (west and north of San Francisco River to Gila River); Maricopa, Mohave, and Navajo Counties; Pinal County (north of a boundary line drawn west along the Gila River to the western city limits of Florence, a straight line from the extreme southwestern city limits of Florence to the extreme southern city limits of Coolidge, then a straight line to the extreme southern city limits of Casa Grande with the line extending to the Maricopa/Pinal County Line); Yavapai and Yuma Counties

PAINTERS:

Area 1: Apache, Coconino, Navajo, and Yavapai Counties (north of Woodruff/Camp Wood Line); Mohave County (north of a line following the Geodetic Hualapai Boundary Line to the Colorado River, a distance of 23 miles east of Pierce Ferry and then intersecting the Arizona/Nevada State Line);  
 Zone A: 0-20 road miles from Courthouse in Flagstaff  
 Zone B: 20-35 road miles from Courthouse in Flagstaff  
 Zone C: 35-80 road miles from Courthouse in Flagstaff  
 Zone D: 80 road miles and over from Courthouse in Flagstaff

Area 2: Apache, Coconino, Navajo, and Yavapai Counties (south of the Woodruff/Camp Wood Line); Gila, Graham, Greenlee, Maricopa, and Pinal Counties (north of 33rd Parallel); Mohave County (south of a line following the Geodetic Hualapai Boundary Line to the Colorado River, a distance of 23 miles east of Pierce Ferry and then intersecting the Arizona/Nevada State Line);  
 Zone A: 0-40 paved road miles from Courthouse in Phoenix; also, Luke and Williams Air Force Bases  
 Zone B: 41-60 paved road miles from Courthouse in Phoenix  
 Zone C: 61 paved road miles and over from Courthouse in Phoenix

Area 3: Cochise County; Graham, Greenlee, Maricopa and Pinal Counties (south of 33rd Parallel); Pima, Santa Cruz, and Yuma Counties;  
 Zone A: 0-30 paved road miles from Stone and Congress in Tucson or from the County Courthouse in Yuma  
 Zone B: 31-40 paved road miles from Stone and Congress in Tucson or from the County Courthouse in Yuma  
 Zone C: 41-50 paved road miles from Stone and Congress in Tucson or from the County Courthouse in Yuma  
 Zone D: 51 paved road miles and over from Stone and Congress in Tucson or from the County Courthouse in Yuma

RW-9

PLASTERERS:\*

Area 1:  
 Zone A  
 Zone B  
 Zone C  
 Area 2:  
 Zone A  
 Zone B  
 Zone C

PLASTERER TENDERS

PLUMBERS:\*

Zone 1  
 Zone 2  
 Zone 3  
 Zone 4

ROOFERS:\*

Area 1  
 Area 2:  
 Zone A:

Roofers and Water-prooferers; Shinglers (asbestos, wood and asphalt)  
 Pitch and Enamel  
 Zone B:  
 Roofers and Water-prooferers; Shingler (asbestos, wood and asphalt)  
 Pitch and Enamel

SHEET METAL WORKERS:\*

Area 1:  
 Zone 1  
 Zone 2  
 Zone 3  
 Area 2:

Zone A  
 Zone B  
 Zone C

SOFT FLOOR LAYERS

SPRINKLER FITTERS

TERRAZZO WORKERS; TILE

SETTERS:\*

Area 1

\*See AREA and ZONE Descriptions - Pages 16 and 17

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and, or Appr. Tr.
\$11.77	.95	\$1.30		.06
12.52	.95	1.30		.06
13.645	.95	1.30		.06
12.67	1.02	1.20		
13.92	1.02	1.20		
14.67	1.02	1.20		
11.55	1.12	1.30		.10
15.49	.75	1.35		.13
15.89	.75	1.35		.13
16.34	.75	1.35		.13
17.84	.75	1.35		.13
13.46	1.095	.95		.05
11.67	1.095	.35		.03
13.67	1.095	.35		.03
14.17	1.095	.35		.03
16.17	1.095	.35		.03
16.39	1.10	1.92		.13
17.64	1.10	1.92		.13
20.39	1.10	1.92		.13
15.65	1.20	1.92		.07
16.86	1.20	1.92		.07
19.53	1.20	1.92		.07
12.46	.60	.12		.21
16.65	.95	1.40		.08
13.06	.90	1.10		.19

**FOOTNOTE:**

a. Employer contributes 8% of basic hourly rate for 5 years' service and 6% of basic hourly rate for 6 months' to 5 years' service as Vacation Pay Credit. Seven Paid Holidays: A through G

**PAID HOLIDAYS:**

A-New Year's Day; B-Memorial Day; C-Independence Day; D-Labor Day; E-Thanksgiving Day; F-Friday after Thanksgiving; G-Christmas Day

**AREA and ZONE DEFINITIONS****PLASTERERS:**

Area 1: Apache, Coconino, and Gila Counties; Graham, Greenlee, Maricopa, and Pinal Counties (north of Sentinel - Casa Grande - Safford Line); Mohave, Navajo, Yavapai, and Yuma Counties:  
 Zone A: 0-35 miles from Phoenix  
 Zone B: 35-60 miles from Phoenix  
 Zone C: 60 miles and over from Phoenix

Area 2: Cochise County; Graham, Greenlee, Maricopa, and Pinal Counties (south of Sentinel - Casa Grande - Safford Line); Santa Cruz County:  
 Zone A: 0-30 miles radius from Tucson  
 Zone B: 30-50 miles radius from Tucson  
 Zone C: 50 miles radius and over from Tucson

**PLUMBERS:**

Zone 1: Area within 15 road miles from either the intersection of Central Avenue and Jefferson Street in Phoenix or the Old Main Building of the University of Arizona in Tucson or the Main Post Office Building in either Douglas, Flagstaff or Yuma; Also, all areas within the City limits of Havasu City, Holbrook, Kingman, Prescott, and Winslow; Also, that area bordered by the Apache Trail on the north, Higley Road on the east, Elliott Road on the south and Arizona Avenue on the west

Zone 2: Over 15 and up to 30 road miles from either the intersection of Central Avenue and Jefferson Street in Phoenix or the Old Main Building of the University of Arizona in Tucson

**PLUMBERS: (Cont'd)**

Zone 3: Over 30 and up to 40 road miles from either the intersection of Central Avenue and Jefferson Street in Phoenix or the Old Main Building of the University of Arizona in Tucson

Zone 4: Over 40 road miles from either the intersection of Central Avenue and Jefferson Street in Phoenix or the Old Main Building of the University of Arizona in Tucson

**ROOFERS:**

Area 1: Apache, Coconino, Gila, Maricopa, Mohave, Navajo, Pinal, Yavapai, and Yuma Counties

Area 2: Cochise, Graham, Greenlee, Pima and Santa Cruz Counties:  
 Zone A: Area less than 44 road miles from City Hall in Tucson  
 Zone B: Area from 44 to 100 road miles from City Hall in Tucson

**SHEET METAL WORKERS:**

Area 1: Apache, Coconino, and Gila Counties; Graham, Greenlee, and Pinal Counties (north of 33rd Parallel); Maricopa, Mohave, Navajo, Yavapai, and Yuma Counties:  
 Zone 1: 0-25 miles radius, excluding Luke and Williams Air Force Bases, from the following base points: the intersection of 56th Street and Indian School Road in Phoenix, and the City Hall in Flagstaff, Kingman, Prescott and Yuma  
 Zone 2: 25-50 miles radius from the base points listed in Zone 1; also Luke and Williams Air Force Bases  
 Zone 3: 50 miles radius and over from the base points listed in Zone 1

Area 2: Cochise, Graham, Greenlee, and Pinal Counties (south of 33rd Parallel); Pima and Santa Cruz Counties:  
 Zone A: 0-25 miles radius from Tucson City Hall or Douglas City Hall  
 Zone B: 25-50 miles radius from Tucson City Hall or Douglas City Hall  
 Zone C: Over 50 miles radius from Tucson City Hall or Douglas City Hall; also San Manuel and vicinity

**TERRAZZO WORKERS; TILE SETTERS:**

Area 1: Apache, Coconino, and Gila Counties; Graham and Greenlee Counties (west and north of San Francisco River to Gila River); Maricopa, Mohave, and Navajo Counties; Pinal County (north of a boundary line drawn west along the Gila River to the western City limits of Florence, a straight line from the extreme southwestern City limits of Florence to the extreme southern city limits of Coolidge, then a straight line to the extreme southern city limits of Casa Grande, with the line extending to the Maricopa/Pinal County Line); Yavapai and Yuma Counties

## LABORERS:

Group 1  
Group 2  
Group 3  
Group 4  
Group 5  
Group 6  
Group 7

(Tunnel and Shaft Work)

Group 1  
Group 2  
Group 3  
Group 4  
Group 5  
Group 5-A

Basic Hourly Rates	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
	C and S AREAS				
N AREA					
\$12.275	\$10.15	\$1.12	\$1.30		.10
12.435	10.31	1.12	1.30		.10
12.605	10.48	1.12	1.30		.10
12.735	10.61	1.12	1.30		.10
12.945	10.82	1.12	1.30		.10
13.41	11.285	1.12	1.30		.10
14.18	12.055	1.12	1.30		.10
12.57	10.445	1.12	1.30		.10
12.775	10.65	1.12	1.30		.10
12.935	10.81	1.12	1.30		.10
13.365	11.24	1.12	1.30		.10
13.60	11.475	1.12	1.30		.10
13.90	11.775	1.12	1.30		.10

## AREA DEFINITIONS

## NORTHERN AREA:

Area north of a straight line drawn between a point 35 miles due north of the City Hall in Flagstaff and a point 35 miles due north of the City Hall in Kingman, extending to the Arizona/Nevada State Line on the west; and connecting to a point 35 miles due north of the City Hall in Holbrook, thence due east to the intersection of the Arizona/New Mexico State Line

## CENTRAL and SOUTHERN AREAS:

All Areas not included in the Northern Area

## LABORERS

Group 1: Laborer, general or construction; Tool Dispatcher or Checker; Manually-controlled Signal Operator; Fence Builder, Guard Rail Builder - highway; Chat Box Man; Dumpman and/or Spotter; Rip Rap Stone Man; Form Stripper; Landscape Gardener and Nurseryman; Packing Rod Steel and Pans; Window Cleaners; Cesspool Diggers and Installers; Concrete Dump Man - belt; Pipe and/or Hoseman; Astro-truf Layers; Clean-up, Bull Gang and Trackman - railroad; Chipper (clearing and grubbing)

Group 2: Cement Finisher Tender; Concrete Curer (Impervious Membrane); Cutting Torch Operator; Fine Grader (highway, engineering and sewer work only); Kettleman - Tarman; Power-type Concrete Buggy

Group 3: Chuck Tender (except tunnel); Sandblaster (Pot Tender); Powderman Tender; Spikers and Wrenchers; Rip Rap Stone Pavers; Creosote Tieman; Guinea Chaser; Bander

Group 4: Operator and Tenders of pneumatic and electric tools; Concrete Vibrating Machines; Chain Saw Machines (on clearing and grubbing); Floor Sanders - concrete; Hydraulic Jacks and similar mechanical tools not separately herein classified; Cement Dumpers (skip-type Mixer or handling bulk cement); Pipe Caulker and/or Backup Man (pipeline); Rigger/Signalman (pipeline); Pipe Wrapper; Cribber and Shorer (except tunnel); Pneumatic Gopher

Group 5: Grade Setter (pipeline); Driller; Jackhammer and/or Pavement Breakers; Pipe Layer (including but not limited to non-metallic, transite and plastic pipe, water pipe, sewer pipe, drain pipe, underground tile and conduit); Rock Slinger; Asphalt Rakers and Ironers; Air and water Wash-out Nozzleman; Scaler (using Bos'n's Chair or Safety Belt); Tampers (mechanical, all types); Hand-guided Trencher and similar operated equipment; Precast Manhole Erector

Group 6: Driller (Core, Diamond, Wagon or Air Track); Sandblaster (Nozzleman); Concrete Saw (hand-guided); Concrete Cutting Torch; Drill Doctor and/or Air Tool Repairman; Gunman and Mixerman (Gunite)

Group 7: Gunite Nozzleman or Rodman; Scaler (Drillers); Form Setter and/or Builder; Welders and/or Pipe Layers, installing process piping; Drillers, Joy Mustang, PR 143, 220 Gardener-Denver, Hydrasonic; Powder Man

**LABORERS (cont'd)**  
(Tunnel and Shaft Workers)

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

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

Group 3: Grout Gunman

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

Group 5: Diamond Drill

Group 5A: Shaft and Raise Miner Welder

RW-11

**POWER EQUIPMENT OPERATORS**  
(Except Piledriving and Steel Erection)

Group 1  
Group 2  
Group 3  
Group 4  
Group 5  
Group 5A  
Group 6  
Group 7

Basic Hourly Rates	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
	<b>C and S AREAS</b>				
	<b>N AREA</b>				
12.875	\$10.75	\$1.40	\$1.30		.08
13.335	11.21	1.40	1.30		.08
13.885	11.76	1.40	1.30		.08
14.545	12.42	1.40	1.30		.08
15.185	13.06	1.40	1.30		.08
15.565	13.44	1.40	1.30		.08
15.975	13.85	1.40	1.30		.08
16.715	14.59	1.40	1.30		.08

**AREA DESCRIPTIONS**

**NORTHERN AREA:**

Area north of a straight line drawn between a point 35 miles due north of the City Hall in Flagstaff and a point 35 miles due north of the City Hall in Kingman, extending to the Arizona/Nevada State Line on the west; and connecting to a point 35 miles due north of the City Hall in Holbrook, thence due east to the intersection of the Arizona/New Mexico State Line

**CENTRAL and SOUTHERN AREAS:**

All Areas not included in the Northern Area

POWER EQUIPMENT OPERATORS  
(Except Piledriving and Steel Erection)

Group 1: Air Compressor Operator; Field Equipment Servicemen Tender; Heavy-duty Repair Tender; Heavy-duty Welder Tender; Oiler; Pump Operator

Group 2: Conveyor Operator; Generator Operator - portable; Power Grizzly Operator; Self-propelled Chip Spreading Machine - Conveyor Operator; Watch Fireman; Welding Machine Operator - gasoline and diesel power

Group 3: Concrete Mixer Operator - skip-type; Driver; Moto-paver, Slurry Seal Machine and similar type equipment; Dinky Operator (under 20 tons wt.); Motor Crane Driver; Power Sweeper Operator, self-propelled; Ross Carrier or Forklift Operator; Skip Loader Operator, all types with rated capacity  $1\frac{1}{2}$  cu. yds. or less; Wheel-type Tractor Operator (Ford, Ferguson, or similar type) with attachments such as Fresno, Push Blade, Post Hole Auger, Mover, etc. excluding compacting equipment

Group 4: A-Frame Boom Truck or Winch Truck Operator; Asphalt Plant Fireman; Elevator Hoist Operator (including Tuskey Hoist or similar type); Grade Checker (excluding Civil Engineer); Multiple power Concrete Saw Operator; Pavement Breaker; Mechanical Compactor Operator, power propelled; Roller Operator, all types, except as otherwise classified; Screed Operator; Self-propelled Chip Spreading Machine Operator (including Slurry Seal Machine Operator); Stationary Pipe Wrapping and Cleaning Machine Operator; Tugger Operator

RW-12

POWER EQUIPMENT OPERATORS (Cont'd)  
(Except Piledriving and Steel Erection)

Group 5: Aggregate Plant Operator (including Crushing, Screening and Sand Plants, etc.); Asphalt Laydown Machine Operator; Asphalt Plant Mixer Operator; Beltcrete Operator; Boring Machine Operator; Concrete Mechanical Tamping, Spreading or Finishing Machine (including Clary, Johnson or similar types); Concrete Pump Operators; Concrete Batch Plant Operator, all types and sizes; Conductor, Brakeman or Handler; Drilling Machine; Elevating Grader Operator, all types and sizes (except as otherwise classified); Highline Cableway Signalman; Field Equipment Serviceman; Kolman Belt Loader Operator or similar with belt width 48" or over; Locomotive Engineer (including Dinky, 20 tons wt. and over); Moto-paver and similar type equipment Operator; Operating Engineer Rigger; Pneumatic-tired Scraper Operator (Turnapull, Euclid, Cat, D-W, Hancock and similar equipment) up to and including 12 cu. yds.; Power Jumbo Form Setter Operator; Pressure Grout Machine Operator (as used in heavy engineering construction); Road Oil Mixing Machine Operator; Roller Operator, on all types asphalt pavement; Self-propelled Compactor, with blade; Skip Loader Operator, all types rated capacity, over  $1\frac{1}{2}$  but less than 4 cu. yds.; Slip Form Operator (power driven lifting device for concrete forms); Soil Cement Road Mixing Machine Operator, single pass type; Stationary Central Generating Plant Operator, rated 300 K. W. or more; Surface Heater and Planer Operator; Traveling Pipewrapping Machine Operator

Group 5A: Heavy-duty Mechanic and/or Welder; Pneumatic-tired Scraper, all sizes and types over 12 cu. yds. up to and including 45 cu. yds. MRC (Turnapull, Euclid, Cat, D-W, Hancock and similar equipment); Tractor Operator (Pusher, Bulldozer, Scraper) up to 400 net horsepower rating; Trenching Machine Operator

**POWER EQUIPMENT OPERATORS (Cont'd)**  
 (Except Piledriving and Steel Erection)

Group 6: Auto Grade Machine (CMI and similar equipment); Boring Machine Operator (including Mole, Badger and similar type); Concrete Mixer Operator, paving type, and Mobile Mixer; Concrete Pump Operator with boom attachment (truck mounted); Crane Operator, Crawler and pneumatic type, under 100 ton capacity MRC; Crawler type Tractor Operator, with boom attachment or slope bar; Derrick Operator; Forklift Operator for hoisting personnel; Grade-all Operator; Helicopter Hoist; Highline Cableway Operator (less than 20 tons rated capacity); Mass Excavator Operator (150 Bucyrus Erie and similar types); Mechanical Hoist Operator (two or more drums); Motor Grade Operator, any type power blade; Motor Grade Operator with elevating grader attachment; Mucking Machine Operator; Overhead Crane Operator; Piledriver Engineer (portable, stationary or skid rig); Pneumatic-tired Scraper Operator, all sizes and types (Turnapull, Euclid, Cat, D-W, Hancock and similar equipment over 45 cu. yds., MRC); Power driven Ditch Lining or Ditch Trimming Machine Operator; Skip Loader Operator, all types with rated capacity 4 cu. yds., but less than 8 cu. yds.; Slip Form Paving Machine Operator (including Gunnert, Zimmerman and similar types); Specialized Power Digger Operator, attached to wheel-type Tractor; Tower Crane (or similar type) Operator; Tractor Operator (Pusher, Bulldozer, Scraper) (400 net horsepower and over); Tugger Operator (two or more); Universal Equipment Operator, Shovel, Backhoe, Dragline, Clamshell, etc., up to 8 cu. yds.

Group 7: Crane Operator, Pneumatic or Crawler (100 ton hoisting capacity and over MRC rating); Helicopter Pilot, FAA qualified, when used in construction work; Highline Cableway Operator, over 20 ton rated capacity and using Traveling Head and Tail Tower; Remote-control Earth Moving Equipment Operator; Skip Loader Operator, all types with rated capacity of 8 cu. yds. or more; Universal Equipment - Shovel, Backhoe, Dragline, Clamshell, etc., 8 cu. yds. and over

RW-13

**TRUCK DRIVERS**

Basic Hourly Rates	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
<b>N AREA</b>	<b>C and S AREAS</b>				
Group 1	\$12.445	\$10.32	\$1.12	\$1.30	.10
Group 2	12.605	10.48	1.12	1.30	.10
Group 3	12.875	10.75	1.12	1.30	.10
Group 4	13.305	11.18	1.12	1.30	.10
Group 5	13.495	11.37	1.12	1.30	.10
Group 5A	13.735	11.61	1.12	1.30	.10
Group 6	13.895	11.77	1.12	1.30	.10
Group 7	14.395	12.27	1.12	1.30	.10
Group 8	15.03	12.905	1.12	1.30	.10
Group 8A	15.825	13.70	1.12	1.30	.10
Group 8B	13.135	11.01	1.12	1.30	.10
Group 8C	15.445	13.32	1.12	1.30	.10

**NORTHERN AREA:**

Area north of a straight line drawn between a point 35 miles due north of the City Hall in Flagstaff and a point 35 miles due north of the City Hall in Kingman, extending to the Arizona/Nevada State Line on the west; and connecting to a point 35 miles due north of the City Hall in Holbrook, thence due east to the intersection of the Arizona/New Mexico State Line

**CENTRAL and SOUTHERN AREAS:**

All Areas not included in the Northern Area

DECISION NO. A281-5142

Page 26

## TRUCK DRIVERS

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

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

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

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

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

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

Group 6: Transit Mix (over 10.5 cu. yds. but less than 14 cu. yds. mixer capacity); Ross Carrier, Fork Lift or Lift Truck; Hydro Lift, Swedish Crane, Iowa 300 and similar types; Concrete Pump (when integral part of Transit Mix Truck); Dump or Flatrack (7 axle); Transport Driver (unless axle rating results in higher classification)

Group 7: Dump or Flatrack (8 axle)

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

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

Group 8B: Heavy-duty Mechanic/Welder Tender

Group 8C: Field Equipment Serviceman or Fuel Truck Drivers

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

Modification Page 1

DECISION NO. AZ81-5142 - Mod. #1  
(46 FR 41299 - August 14, 1981)

Statewide, Arizona

Change:

Painters: Area 2:

Zone A:

Brush and Roller;  
Sandblaster (Nozzle-  
man); Sheetrock  
Taper; Floor Coverer;  
Sandblaster (Pot  
Tender)

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and/or Appr. Tr.
\$13.14	.60	.60		.10
13.39	.60	.60		.10
13.47	.60	.60		.10
13.54	.60	.60		.10
13.79	.60	.60		.10
14.00	.60	.60		.10
14.07	.60	.60		.10
14.27	.60	.60		.10
14.14	.60	.60		.10
14.39	.60	.60		.10
14.47	.60	.60		.10
14.54	.60	.60		.10
14.79	.60	.60		.10
15.00	.60	.60		.10
15.07	.60	.60		.10
15.27	.60	.60		.10

Spray; Paperhanger  
Creosote Applier  
Swing Stage:

Brush; Sandblaster  
Spray  
Steeplejack

Steel and bridge,  
brush; Nozzleman and  
Pot Tender; Steel  
(steam cleaner);  
Electric and air too  
Operator; Steel

Sandblaster  
Steel and bridge,  
Spray

Zone B:

Brush and Roller;  
Sandblaster (Nozzle-  
man); Sheet Rock  
Taper; Floor Coverer;  
Sandblaster (Pot  
Tender);

Spray; Paperhangers  
Creosote Applier

Swing Stage:  
Brush; Sandblaster  
Spray

Steeplejack

Steel and bridge,  
Brush; Nozzleman  
and Pot Tender;  
Steel (steam cleaner);  
Electric and air  
tool Operator; Steel

Sandblaster  
Steel and bridge,  
spray

RW-15

Modification Page 2

DECISION NO. AZ81-5142 (Cont'd)

Zone C:

Brush and Roller;  
Sandblaster (Nozzle-  
man); Sheet Rock  
Taper; Floor Coverer;  
Sandblaster (pot  
Tender)

Spray; Paperhangers  
Creosote Applier

Swing Stage:  
Brush; Sandblaster  
Spray

Steeplejack

Steel and bridge;  
Brush; Nozzleman and  
Pot Tender; Steel  
(steam cleaner);  
Electric, air tool  
operator; Steel

Sandblaster  
Steel and bridge,  
Spray

Basic Hourly Rates	Fringe Benefits Payments			
	H & W	Pensions	Vacation	Education and/or Appr. Tr.
\$15.64	.60	.60		.10
15.89	.60	.60		.10
15.97	.60	.60		.10
16.04	.60	.60		.10
16.29	.60	.60		.10
16.50	.60	.60		.10
16.57	.60	.60		.10
16.77	.60	.60		.10

Modification Page 1

## DECISION NO. AZ81-5142 - Mod. #2

(46 FR 41299-August 14, 1981)

Statewide, Arizona

	Basic Hourly Rates	Fringe Benefits Payments			
		H&M	Pensions	Vacation	Education and/or App. Tr.
<b>Change:</b>					
Boilermakers	\$18.31	\$1.30	\$1.25	\$1.00	.04
Bricklayers; Stone-masons (Northern Area)					
Zone Definitions for					
Zone A and B ONLY:					
Zone A: 0-40 road miles from the City Hall in Phoenix					
Zone B: 40-50 road miles from the City Hall in Phoenix					
Zone A	14.63	1.07	1.30		.18
Zone B	15.80	1.07	1.30		.18
Zone C	16.53	1.07	1.30		.18
Zone D	17.26	1.07	1.30		.18
Zone E	17.85	1.07	1.30		.18
Zone F	19.02	1.07	1.30		.18

Modification Page 1

DECISION NO. AZ81-5142 - Mod. #3

(46 FR 41299 - August 14, 1981)

Statewide, Arizona

Change:

Electricians:

Area 2:

Electricians;  
Technicians and  
Cable Splicers:

Zone A

Zone B

Lathers:

Area 1

Painters:

Area 3:

Zones A, B, and D  
Change Health and  
Welfare ONLY

Zone C:

Brush

Spray

Paperhangers

Swing Stage, under 40  
feet:

Brush

Spray

Swing Stage, over 40  
feet:

Brush

Spray

Structural Steel and

Tanks:

Brush

Spray & Sandblasters

Plumbers:

Zone 1

Zone 2

Zone 3

Zone 4

	Basic Hourly Rates	Fringe Benefits Payments			
		H & W	Pensions	Vacation	Education and/or Appr. Tr.
Zone A	\$17.00	.96	38+.93		1/28
Zone B	20.12	.96	38+.93		1/28
Area 1	14.325	1.00			.06
Zones A, B, and D Change Health and Welfare ONLY		.97			
Zone C:					
Brush	12.82	.97	.50		.10
Spray	13.42	.97	.50		.10
Paperhangers	12.95	.97	.50		.10
Swing Stage, under 40 feet:					
Brush	13.12	.97	.50		.10
Spray	13.72	.97	.50		.10
Swing Stage, over 40 feet:					
Brush	13.57	.97	.50		.10
Spray	14.17	.97	.50		.10
Structural Steel and Tanks:					
Brush	13.82	.97	.50		.10
Spray & Sandblasters	14.42	.97	.50		.10
Plumbers:					
Zone 1	17.09	1.20	1.35		.23
Zone 2	17.49	1.20	1.35		.23
Zone 3	18.74	1.20	1.35		.23
Zone 4	20.09	1.20	1.35		.23

**SPECIFICATIONS**

for

**SKUNK CREEK CHANNEL  
AND LEVEES**

and

**OVERLOOK (JOMAX) ROAD  
WIDENING**

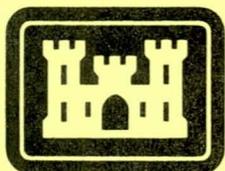
**Maricopa County, Arizona**

Gila River Basin

New River and Pheonix City Streams

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

Authority: Appropriation Bill for FY82



**US Army Corps  
of Engineers**

Los Angeles District

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

PART I SPECIAL PROVISIONS

PART II TECHNICAL PROVISIONS

<u>Section</u>	<u>Title</u>
1A	General Requirements
1B	Measurement and Payment
1D	Environment Protection
2A	Diversion and Control of Water
2B	Clearing Site and Removing Obstructions
2C	Topsoil Fill
2D	Excavation
2E	Fills and Subgrade Preparation
2F	Aggregate Base
2G	Prime Coat and Weed Killer
2H	Asphalt Concrete
2I	Seeding
2J	Culverts
2K	Stone Protection
2L	Fencing and Guard Rails
3A	Formwork for Concrete
3B	Concrete Reinforcement
3C	Expansion, Contraction and Construction Joints In Concrete
3D	Cast-in Place Structural Concrete
3E	Pneumatically Placed Concrete
3F	Grouting Stone Protection

PART I

SPECIAL PROVISIONS

Index

- |  |                                       |
|--|---------------------------------------|
| 1. Commencement, Prosecution, and Completion of Work | 9. Damage to Work                     |
| 2. Liquidated Damages                                | 10. Performance of Work by Contractor |
| 3. Contract Drawings, Maps and Specifications        | 11. Contractor Quality Control        |
| 4. Contractor Submittals                             | 12. Progress Schedule                 |
| 5. Physical Data                                     | 13. Deleted                           |
| 6. Salvage Materials and Equipment                   | 14. Time Extension                    |
| 7. Layout of Work                                    | 15. Continuing Contracts              |
| 8. Quantity Surveys                                  | 16. Approved Aggregate Sources        |

1. COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK. (1965 APR OCE) The Contractor will be required to commence work under this contract within 5 calendar days after the date of receipt by him of notice to proceed, to prosecute the said work diligently, and except for seeding, to complete the entire work ready for use in accordance with the Completion Schedule hereinafter. Seeding shall be accomplished as soon as practicable and within time limits stated in the Technical Provisions or directed by the Contracting Officer. The time stated for completion shall include final clean-up of the premises.

1.1 Completion Schedule. Subject to the provisions of the paragraph entitled "Public Utilities, Notices, and Restrictions," of the section entitled "General Requirements," the Contractor shall complete pertinent parts of the entire work not later than the number of calendar days after the date of receipt of notice to proceed as specified below:

<u>Description</u>	<u>Completion</u>
Skunk Creek Channel and Levees	365 days
Overlook (Jomax) Road Widening	75 days

2. LIQUIDATED DAMAGES (1965 JAN). In case of failure on the part of the Contractor to complete the work within the time fixed in the contract or any extensions thereof, the Contractor shall pay to the Government as liquidated damages, pursuant to the clause of this contract entitled "Termination for Default-Damages for Delay-Time Extensions," the following sums separately for each each of delay.

2.1 Completion of Skunk Creek Channel and Levees including clean-up as specified in subparagraph 1.1; \$400.00.

2.2 Completion of Overlook (Jomax) Road Widening including clean-up as specified in subparagraph 1.1; (\$210.00).

3. CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS (1965 JAN).

3.1 Ten sets of large scale contract drawings, maps and specifications will be furnished the Contractor without charge, except applicable publications incorporated into the Technical Provisions by reference. Additional sets will be furnished on request at the cost of reproduction. The work shall conform to the following contract drawings and maps, all of which form a part of these specifications and are available in the office of the U.S. Army Engineer District, Los Angeles, 300 North Los Angeles Street, Los Angeles, California.

SKUNK CREEK CHANNEL AND LEVEES

Drawing No. (District File No.)	Title
252/73	Title Sheet and Index to Contract Drawings
252/74	Project Location
252/75	General Plan-Sheet 1
252/76	General Plan-Sheet 2
252/77	Plan of Exploration
252/78	Soil Logs
252/79	Borrow & Miscellaneous Fill Details-Sheet 1
252/80	Borrow & Miscellaneous Fill Details-Sheet 2
252/81	West Levee-Plan and Profile Sta. 169+69.62 to 162+00
252/82	West Levee-Plan and Profile Sta. 162+00 to 148+15.87
252/83	West Levee-Plan and Profile Sta. 148+15.87 to 138+00
252/84	West Levee-Plan and Profile Sta. 138+00 to 127+00
252/85	West Levee-Plan and Profile Sta. 127+00 to 116+00
252/86	West Levee-Plan and Profile Sta. 116+00 to 106+28.67
252/87	East Levee-Plan and Profile Sta. 137+50 to 128+00
252/88	East Levee-Plan and Profile Sta. 128+00 to 117+00
252/89	East Levee-Plan and Profile Sta. 117+00 to 106+28.67
252/90	Channel-Plan and Profile Sta. 106+28.67 to 98+20
252/91	Channel-Plan and Profile Sta. 98+20 to 93+44.02
252/92	Channel-Plan and Profile Sta. 93+44.02 to 86+50
252/93	Channel-Plan and Profile Sta. 86+50 to 79+00
252/94	Channel-Plan and Profile Sta. 79+00 to 73+00
252/95	West Levee Sections Sta. 168+00 to 128+00
252/96	West Levee Sections Sta. 124+00 to 106+30
252/97	East Levee Sections Sta. 135+50 to 106+30
252/98	Channel Sections Sta. 106+33.67 to 100+00
252/99	Channel Sections Sta. 98+00 to 93+50
252/100	Channel Sections Sta. 93+00 to 86+00
252/101	Channel Sections Sta. 84+00 to 79+00
252/102	Channel Sections Sta. 78+00 to 74+00
252/103	West Levee & Channel Access Road Detail

Drawing No.  
(District File No.)

Title (Continued)

252/104	East Levee & Channel Access Road Detail
252/105	Profile Access Roads
252/106	Turn Arounds, Fencing and Guard Rail
252/107	Side Drain
252/108	Channel Plan
252/109	South Channel Wall Elevation
252/110	North Channel Wall Elevation
252/111	Channel Wall Sections and Details
252/112	Pier Nose Extensions
252/113	Head Wall
252/114	Miscellaneous Structural Details
252/115	Side Drain Box Culvert
252/116	Landscape Plan Sheet 1
252/117	Landscape Plan Sheet 2

OVERLOOK ROAD WIDENING

244/167	Index to Contract Drawings
244/168	Project Location
244/169	General Plan
244/170	Plan and Profile, Sta. 56+10+ to Sta. 110+03.11
244/171	Plan and Profile, Sta. 110+03.11 to Sta. 158+09.76
244/172	Miscellaneous Details

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

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

4. CONTRACTOR SUBMITTALS.

4.1 General. Reference is made to the General Provision entitled "Shop Drawings". The Contractor shall submit for approval all shop drawings, certificates of compliance and/or equipment lists called for under the various headings of these specifications. These drawings, certificates and lists shall be complete and detailed. If approved by the Contracting Officer, each copy of the drawings, certificates, or lists will be identified as having received such approval by being so stamped and dated. The Contractor shall make any corrections required by the Contracting Officer. Unless otherwise specified in the Technical Provisions, the number of copies to be submitted shall be as stated herein. The Contractor shall complete ENG Form 4025, "Transmittal of Shop Drawings, Equipment

Data, Material Samples, or Manufacturer's Certificates of Compliance for Approval" and forward 6 copies of same with each set of shop drawings, certificates of compliance, or equipment lists submitted. Blank ENG Forms 4025 will be furnished by the Contracting Officer on request. Each shop drawing submitted for approval shall have, in the lower right hand corner just above the title, a white space 3 inches x 4 inches in which the Contracting Officer can indicate the action taken. Shop drawings for submittal shall be either blue line or black line prints on a white background. Blueprints are not acceptable. Each shop drawing, certificate of compliance, and/or equipment list shall be identified with the following information as applicable:

Contract Number  
Project Title and Location  
Subcontractor's Name  
Supplier's Name  
Manufacturer's Name  
Contract Specification and Paragraph Number  
Contract Drawing File Number

4.1.1 Contractor Certification. Each submittal of the shop drawings shall contain the following certification on the face of the ENG Form 4025 accompanying the submittal:

"I have reviewed the shop drawings in detail and they are correct and in strict conformance with the contract drawings and specifications except as otherwise explicitly stated.

Authorized Prime Contractor Representative"

4.2 Shop Drawings and Materials Submittal Register. Within 15 calendar days after commencement of work under this contract, the Contractor shall submit a preliminary register showing all shop drawings, certificates of compliance, equipment lists, samples, and other data required to be submitted under the various headings of these specifications. The register shall be submitted in duplicate. The preliminary register shall show the submittal identification number, the type of submittal, and the description for all items to be submitted under this contract and, for all items needed prior to submittal of the Project Progress Schedule, the scheduled submittal date, approval need date, and the material/equipment need date shall also be included. The register shall be expanded to include all Contractor scheduled dates and shall be resubmitted within 15 calendar days after submittal of the project progress schedule. After original approval the register shall be updated to indicate actual dates, actions completed, and any additional submittals or resubmittals required, and two copies of all updated sheets shall be submitted on or before the fifteenth of each month. The register shall provide adequate time for review and approval of the submitted material and shall be coordinated with the construction progress schedule to assure that all equipment and materials will be available for incorporation into the work in accordance with approved schedule of construction operations. Payment for materials incorporated into the work will not be allowed until required approvals have been obtained.

4.3 Shop Drawings. The Contractor shall submit to the Contracting Officer for approval 10 copies of all shop drawings as called for under the various headings of these specifications. Nine sets of all shop drawings will be retained by the Contracting Officer and one set will be returned to the Contractor.

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

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

#### 5. PHYSICAL DATA (1965 JAN).

5.1 General. Information and data furnished or referred to below are furnished for the Contractor's information. However, it is expressly understood that the Government will not be responsible for any interpretation or conclusion drawn therefrom by the Contractor.

5.2 The physical conditions indicated on the drawings and in the specifications are the result of site investigations by survey, test trenches, and borings.

5.3 Weather Conditions. Average temperatures and rainfall data may be obtained from the U.S. Weather Bureau in Phoenix, Arizona.

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

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

6. SALVAGE MATERIALS AND EQUIPMENT (1965 JAN). The Contractor shall maintain adequate property control records for all materials or equipment specified to be salvaged. These records may be in accordance with the Contractor's system of property control, if approved by the property administrator. The Contractor shall be responsible for the adequate storage and protection of all salvaged materials and equipment which are broken or damaged during salvage operations as the result of his negligence, or while in his care.

7. LAYOUT OF WORK (1965 APR OCE).

7.1 Horizontal and Vertical controls have been established at the site of the work.

7.2 From the established controls the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the contract drawings, subject to such modifications as the Contracting Officer may require to meet changed conditions or as a result of necessary modifications to the contract work.

7.3 The Contractor shall furnish, at his own expense, such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the established controls. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Contracting Officer or others until authorized to remove them and if such marks are destroyed, by the Contractor or through his negligence prior to their authorized removal they may be replaced by the Contracting Officer, at his discretion, and the expense of replacement will be deducted from any amounts due to become due the Contractor. The Contracting Officer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking of the work.

8. QUANTITY SURVEYS (1979 MAR).

8.1 The Contractor shall make such surveys and computations as are necessary to determine the quantities of work performed or placed during each period for which a progress payment is to be made. The Contractor shall also make original and final surveys. The Government will make such computations as are necessary to determine the quantities of work performed or finally in place. Unless waived by the Contracting Officer in each specific case, quantity surveys made by the Contractor shall be made under the direction of a representative of the Contracting officer.

8.2 All original field notes, computations and other records of the Contractor for the purposes of layout, original, progress and final surveys shall be furnished promptly to the representative of the Contracting Officer at the site of the work and shall be used by the Contracting Officer to the extent necessary in determining the proper amounts of progress and final payments. A copy of the original notes, computations and records furnished to the Contracting Officer shall be retained by the Contractor.

9. DAMAGE TO WORK (1966 MAR OCE). The responsibility for damage to any part of the permanent work shall be as set forth in the clause of the contract entitled "Permits and Responsibilities." However, if, in the judgment of the Contracting officer, any part of the permanent work performed by the Contractor is damaged by flood or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor will make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work an equitable adjustment pursuant to Clause 3, Changes, of the contract, will be made as full compensation for the repairs of that part of the permanent work for which there

are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

10. PERFORMANCE OF WORK BY CONTRACTOR (1965 JAN). The Contractor shall perform on the site, and with his own organization, work equivalent to at least thirty-five percent (35%) of the total amount of work to be performed under the contract. If, during the progress of the work hereunder the Contractor requests a reduction in such percentage and the Contracting Officer determines that it would be to the Government's advantage, the percentage of the work required to be performed by the Contractor may be reduced; provided, written approval of such reduction is obtained by the Contractor from the Contracting Officer.

11. CONTRACTOR QUALITY CONTROL. The Contractor shall provide and maintain an effective quality control program that complies with the clause of the contract entitled "Contractor Inspection System."

11.1 The Contractor shall establish a quality control system to perform sufficient inspection and tests of all items of work, including that of his subcontractors, to ensure conformance to applicable specifications and drawings with respect to the materials, workmanship, construction, finish, functional performance, and identification. This control will be established for all construction except where the Technical Provisions of the contract provide for specific Government control by inspections, tests or other means. The Contractor's control system will specifically include the surveillance and tests required in the Technical Provisions of the contract specifications.

11.2 The Contractor's quality control system is the means by which the assures himself that his construction complies with the requirements of the contract plans and specifications. The controls shall be adequate to cover all construction operations and should be keyed to the proposed construction sequence.

11.3 The Contractor's job supervisory staff may be used for quality control, supplemented as necessary by additional personnel for surveillance, special technicians, or testing facilities to provide capability for the controls required by the Technical Provisions of the specifications. Prior approval is required for facilities, equipment, and personnel used by the Contractor in performing the specified tests.

11.4 After the contract is awarded and before construction operations are started, the Contractor shall meet with the Contracting Officer, or his representative, and discuss quality control requirements. The meeting shall develop mutual understanding relative to details of the system, including the forms to be used for recording the quality control operations, inspections, administration of the system, and the interrelationship of Contractor and Government inspection.

11.5 The Contractor shall submit for approval within 10 days after the receipt of the Notice to Proceed a quality control plan which shall include the procedures, instructions, and reports to be used. This document will include as a minimum:

- (1) The quality control organization.
- (2) Number and qualifications of personnel to be used for this purpose.

(3) Authority and responsibilities of quality control personnel.

(4) Methods of quality control including that for his subcontractor's work.

(5) Test methods including, as specified, name of qualified testing laboratory to be used.

(6) Method of documenting quality control operation, inspection, and testing.

(7) A copy of a letter of direction to the Contractor's representative responsible for the quality control, outlining his duties and responsibilities, and signed by a responsible officer of the firm.

11.6 Unless specifically authorized in writing no construction shall be started until the Contractor's quality control plan is approved.

11.7 All compliance inspection will be recorded on an approved form, including but not limited to the specific items required in the Technical Sections of the Specifications. This form, to include records of corrective action taken, will be furnished to the Government as required by the Contracting Officer.

11.8 If recurring deficiencies in an item or items indicate that the quality control system is not adequate, such corrective actions will be taken as directed by the Contracting Officer.

11.9 In the event the Contractor fails to satisfactorily perform any required inspections and tests; to submit timely, complete, and factual reports and test data; or otherwise comply with the quality control provisions, the Contracting Officer may provide these services from another source and all costs for providing these services will be deducted from payments due the Contractor.

## 12. PROGRESS SCHEDULE.

12.1 Reference is made to the General Provision entitled "Progress Charts and Requirements for Overtime Work."

12.2 The Progress schedule shall provide for a uniform rate of progress throughout the entire construction period. Actual progress shall be entered on the schedule weekly. The determination of whether or not the work is behind schedule will be based upon a uniform rate of production in each feature of the work. Falling more than 5 calendar days behind the approved progress schedule in any feature of the work shall constitute sufficient grounds for a determination that the Contractor has fallen behind the progress schedule. Failure of the Contracting Officer to act under this provision shall in no way relieve the Contractor of the responsibility for completion of the work on schedule.

## 13. DELETED.

14. TIME EXTENSION (1965 JAN). Notwithstanding any other provisions of this contract it is mutually understood that the time extensions for changes in the work depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements so delayed and that the remaining contract completion

dates for all other portions of the work will not be altered and may further provide for an equitable readjustment of liquidated damages pursuant to the new completion schedule.

15. CONTINUING CONTRACTS (1977 OCT OCE).

15.1 This is a continuing contract, as authorized by Section 10 of the River and Harbor Act of September 22, 1922 (33 U.S. Code 621). The payment of some portion of the contract price is dependent upon reservations of funds from future appropriations. The responsibilities of the Government are limited by this clause notwithstanding any contrary provision of the "Payments to Contractor" clause or any other clause of this contract.

15.2 The sum of \$1,000,000 has been reserved for this contract and is available for payments to the Contractor during the current fiscal year. It is expected that Congress will make appropriations for future fiscal years from which additional funds will be reserved for this contract.

15.3 Failure to make payments in excess of the amount currently reserved, or that may be reserved from time to time, shall not entitle the Contractor to a price adjustment under the terms of this contract except as specifically provided in paragraphs 15.6, 15.7, 15.8 and 15.9 below. No such failure shall constitute a breach of this contract, except that this provision shall not bar a breach-of-contract action if an amount finally determined to be due as a termination allowance remains unpaid for one year due solely to a failure to reserve sufficient additional funds therefor.

15.4 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 in writing of any additional funds reserved for the contract.

15.5 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 the amount of additional funds which will be needed to meet payments due or to become due under the contract during that fiscal year. This notice shall be given not less than 45 nor more 60 days prior to the estimated date of exhaustion.

15.6 No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract. The Contractor shall be entitled to simple interest on any payment that the Contracting Officer determines was actually earned under the terms of the 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, for the Renegotiation Board, as in effect on the first day of the delay in such payment.

15.7 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 the "Suspension of Work" clause or in any other manner under this contract.

15.8 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.

15.9 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 considered a termination for the convenience of the Government.

15.10 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 the contract during the fiscal year, the Government reserves the right, after notice to the Contractor, to reduce said reservation by the amount of such expenses.

16. APPROVED AGGREGATE SOURCES (1965 APR OCE).

16.1 Concrete Aggregates meeting the requirements of these specifications can be produced from the sources listed below.

16.1.1 Commercial sources along the Salt River near Phoenix, Arizona.

16.1.2 Commercial sources along the Agua Fria River near Luke Air Force Base.

16.1.3 Commercial or new sources along Skunk Creek in the vicinity of Adobe Dam.

16.2 Concrete Aggregate may be furnished from any of the above listed sources or at the option of the Contractor may be furnished from any other source designated by the Contractor and approved by the Contracting Officer, subject to the condition hereinafter stated.

16.3 After the Award of the Contract, the Contractor shall designate in writing only one source or one combination of sources from which he proposes to furnish aggregates. If the Contractor proposes to furnish aggregates from a source or from sources not listed above, he may designate only a single source or single combination of sources for aggregates. Samples for acceptance testing shall be provided as required by Section: CAST-IN-PLACE STRUCTURAL CONCRETE of the "Technical Provisions". If a source for coarse or fine aggregate so designated by the Contractor is not approved for use by the Contracting Officer, the Contractor may not submit for approval other sources but shall furnish the coarse or fine aggregate, as the case may be, from an approved source listed above at no additional cost to the Government.

16.4 Approval of a source of concrete aggregate is not to be construed as approval of all materials from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for concrete aggregate as determined by the Contracting Officer. Materials produced from an approved source shall meet all the requirements of Section: CAST-IN-PLACE STRUCTURE CONCRETE of the "Technical Provisions" of these specifications.

\* \* \* \* \*

PART II

TECHNICAL PROVISIONS

SECTION 1A

GENERAL REQUIREMENTS

Index

- |  |  |
|--|--|
| 1. Applicable Publications                           | 9. Archaeological Findings<br>During Construction          |
| 2. Project Facilities                                | 10. Public Utilities, Notices,<br>and Restrictions         |
| 3. Construction Signs                                | 11. Public Safety.   |
| 4. Project Engineer's Office<br>and Laboratory       | 12. Occupational Safety and Health<br>Act (OSHA) Standards |
| 5. Bulletin Board                                    | 13. Quality Control  |
| 6. Maintenance and Disposal of<br>Project Facilities | 14. Dust Control   |
| 7. Scrap Materials                                   | 15. Permits  |
| 8. Salvage Materials                                 |  |

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

1.1 Federal Specifications (Fed. Spec.):

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

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

PS 1-74	Plywood, Construction and Industrial
---------	--------------------------------------

2. PROJECT FACILITIES. The Contractor shall construct and/or erect the following project facilities.

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

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

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

2.1.3 Six hard hat signs at locations directed.

2.2 Project Engineer's Office and Laboratory, including a fenced parking area and a flagpole.

2.3 Bulletin Board at the Contractor's office.

2.4 Sanitary Facilities.

### 3. CONSTRUCTION SIGNS.

#### 3.1 Materials.

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

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

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

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

#### 3.2 Construction.

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

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

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

### 4. PROJECT ENGINEER'S OFFICE AND LABORATORY.

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

complete, with all piping and electrical connections. An adequate supply of cooled drinking water shall be furnished and maintained. Open parking space for 6 vehicles and water and sanitary facilities shall be located convenient to the office and laboratory. The combined parking and building area shall be enclosed with a woven wire fence approximately 6 feet high with a 10-foot wide lockable gate accessible from a road or street. The fenced area shall be of sufficient size to permit ease in the parking of vehicles. Materials for the facilities need not be new provided they are adequate for the intended use.

4.2 Two Office Trailers shall each be approximately 10 feet wide by 60 feet in length.

4.3 Laboratory Building shall be a weathertight prefabricated metal structure and shall have a 6-inch steel-troweled concrete slab floor and contain not less than 3,000 square feet of floor area. At least 200 square feet of the building shall have an 18-foot ceiling clearance. The laboratory shall be equipped with water supply, a sink approximately 20 x 35 x 8 inches, and the usual utilities. A covered porch with slab (50 x 12 feet) shall also be provided.

4.4 Flagpole. The Contractor shall furnish and erect a flagpole at the Project Engineer's Office. The flagpole shall be either wood or sectional steel type, a product of a reputable manufacturer who has been regularly engaged in the manufacture of flagpoles. The flagpole shall be complete with standard fittings and equipment, including pulley, cleats, ground protector, halyards, and snap hooks. The pole shall have 20 feet exposed height and be set in concrete foundation in conformance with the manufacturer's recommendations. Painting of the wooden pole shall conform to the applicable requirements for the project sign. Steel pole shall be galvanized.

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

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

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

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

9. **ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION.** There are no known archaeological remains at the project site. Should any skeletons, artifacts, or other archaeological remains be uncovered, the Contractor shall suspend operations at the site of discovery and continue operations in other areas. The Contractor shall notify the Project Engineer immediately of the findings. Included with the notifications shall be a brief statement to the Contracting Officer of the location and 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 General Provisions of the contract.

10. **PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS.**

10.1 **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.

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

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

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

10.5 **Notices.**

10.5.1 **Traffic Routing.** The Contractor shall notify the Contracting Officer 7 days in advance of the time work will be started in areas requiring the

rerouting of traffic, traffic lane striping, and removal of street signs. The foregoing shall apply to progressive modifications of traffic routings within an area in which work is in progress.

10.5.1.1 Overlook (Jomax) Road. The overlook road will be closed to all traffic during the construction period specified in the SPECIAL PROVISIONS.

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

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

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

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

10.5.6 Installation of Rights-of-Way Fence. Exact location and alinement for installation of the rights-of-way fence will be staked in the field by others on notification to the Contracting Officer by the Contractor 7 calendar days in advance of the scheduled starting of the R/W fence installation.

#### 10.6 Restrictions.

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

11. PUBLIC SAFETY. Attention is invited to the general provision: 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 or any dangerous conditions to be encountered and he shall furnish, erect, or maintain such fences, barricades, lights, signs and other devices as are necessary to prevent accidents and avoid damage or injury to the public. Flagmen and guards, while on duty and assigned to give warning and safety devices shall conform to applicable city, county, and state requirements. Should the Contractor appear to be neglectful or negligent in furnishing adequate warning and protection measures, the Contracting Officer may direct attention to the existence of a

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

12. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) STANDARDS. The OCCUPATIONAL SAFETY and 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 Safety and Health Requirements Manual, EM 385-1-1, are both applicable to this contract. The most stringent requirement of the two standards will be applicable.

13. QUALITY CONTROL. The Contractor shall inspect the work of his own forces and the work of all subcontractors for compliance with the contract requirements and record the results of the inspections. Legible copies of the daily inspection reports shall be maintained by the Contractor at the project site at all times and the original copies of the "Construction Quality Control Report" shall be delivered to the Contracting Officer on the work day following the date of the report.

13.1 Control of onsite construction. The Contractor's control shall include three phases of inspection for all definable features of work, as follows.

13.1.1 Preparatory inspection shall be performed prior to beginning any work on any definable feature of work. It shall include a review of contract requirements; a check to assure that all materials and/or equipment have been tested, submitted, and approved; a check to assure that provisions have been made to provide required control testing; examination of the work area to ascertain that all preliminary work has been completed; and a physical examination of material and equipment to assure that they conform to approved shop drawings or submittal data and that all material and/or equipment are on hand.

13.1.2 Initial inspection shall be performed as soon as work begins on a representative portion of the particular feature of work and shall include examination of the quality of workmanship as well as a review of control testing for compliance with contract requirements.

13.1.3 Follow-up inspections shall be performed daily to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work.

13.2 The specified reports must be factual records of the Contractor's daily quality control activities and resulting actions. As such, they shall stress as major components of the report, the following:

(a) Phase(s) of construction underway during the time frame of the report. (i.e. earthwork, concrete work, structural steel erection, etc.)

(b) Phase (preparatory, initial, or follow-up), and locations of inspections and/or check tests that were made.

(c) Results of inspection, including nature of deficiencies observed and corrective actions taken or to be taken. If no inspections are listed on the report, it must be assumed that no inspections were made and that CQC is not being implemented.

(d) Report of tests performed, including those specified, with the results of the tests, including failures and remedial action to be taken. Test results, including all computations should be attached to the report form. Where test results cannot be completed by the time the report is submitted, a notation should be made that the test was performed and the approximate date test results will be available. Delayed test results should be submitted with the report form on the date received.

(e) Monitoring of materials and equipment upon arrival at the jobsite and prior to incorporation into the work for compliance with submittal approvals, damage and proper storage.

(f) Offsite surveillance activities.

(g) Job Safety.

13.3 The report must contain a record of inspections and test for all work accomplished subsequent to the previous report. Separate reports in different phases of the work may be submitted by the responsible CQC inspectors or they may be combined into one consolidated report if all CQC activities and results are covered and the responsible CQC inspectors are identified.

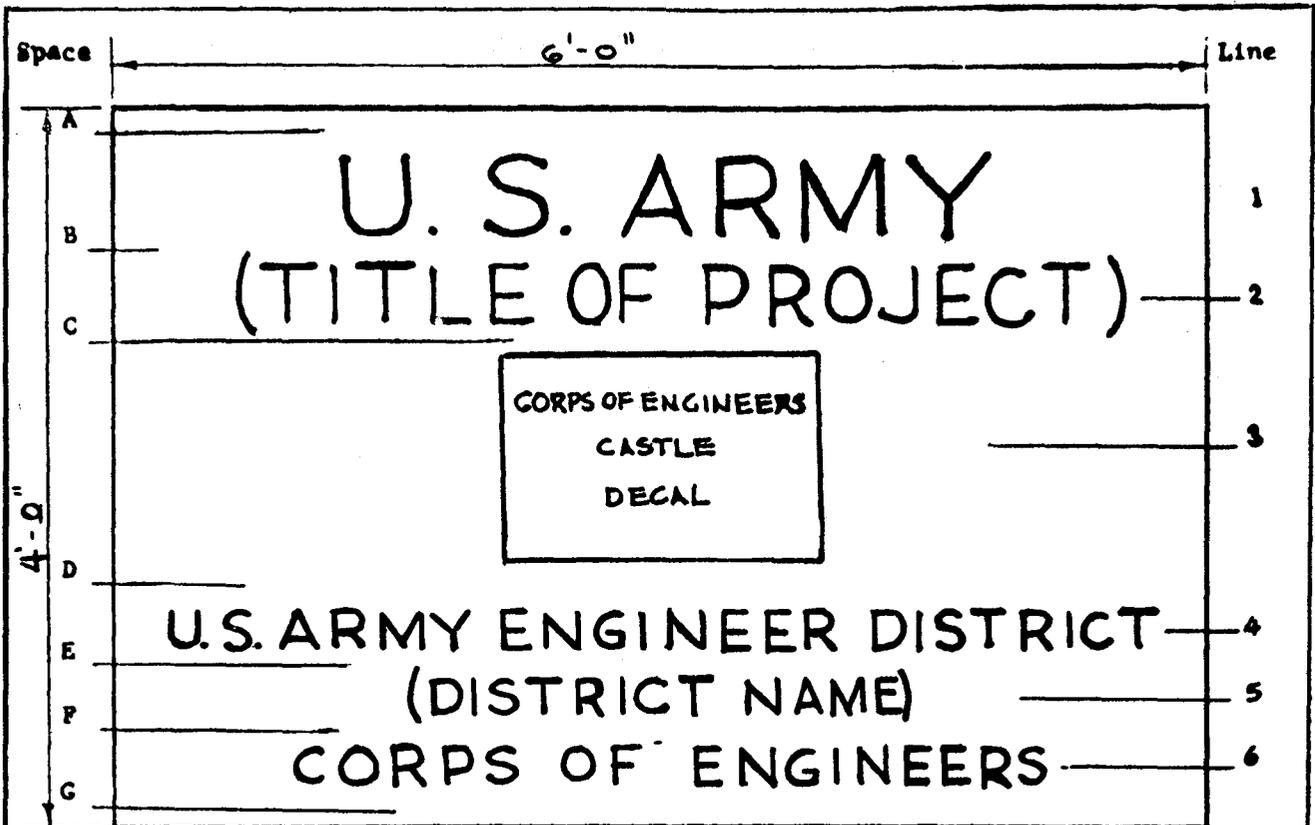
13.4 In all cases, the report or reports must be verified and signed by the one person delegated this responsibility by the Contractor. The verification should contain the statement that all supplies and materials incorporated in the work are in compliance with the terms of the contract except as noted.

14. DUST CONTROL. The Contractor shall provide an acceptable plan for preventing the generation of dust due to his operation in construction zones, along haul routes, in equipment parking areas, and in waste areas located on the Base. This plan may consist of water sprinkling or an equivalent service.

15. PERMITS.

15.1 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.

\* \* \* \* \*



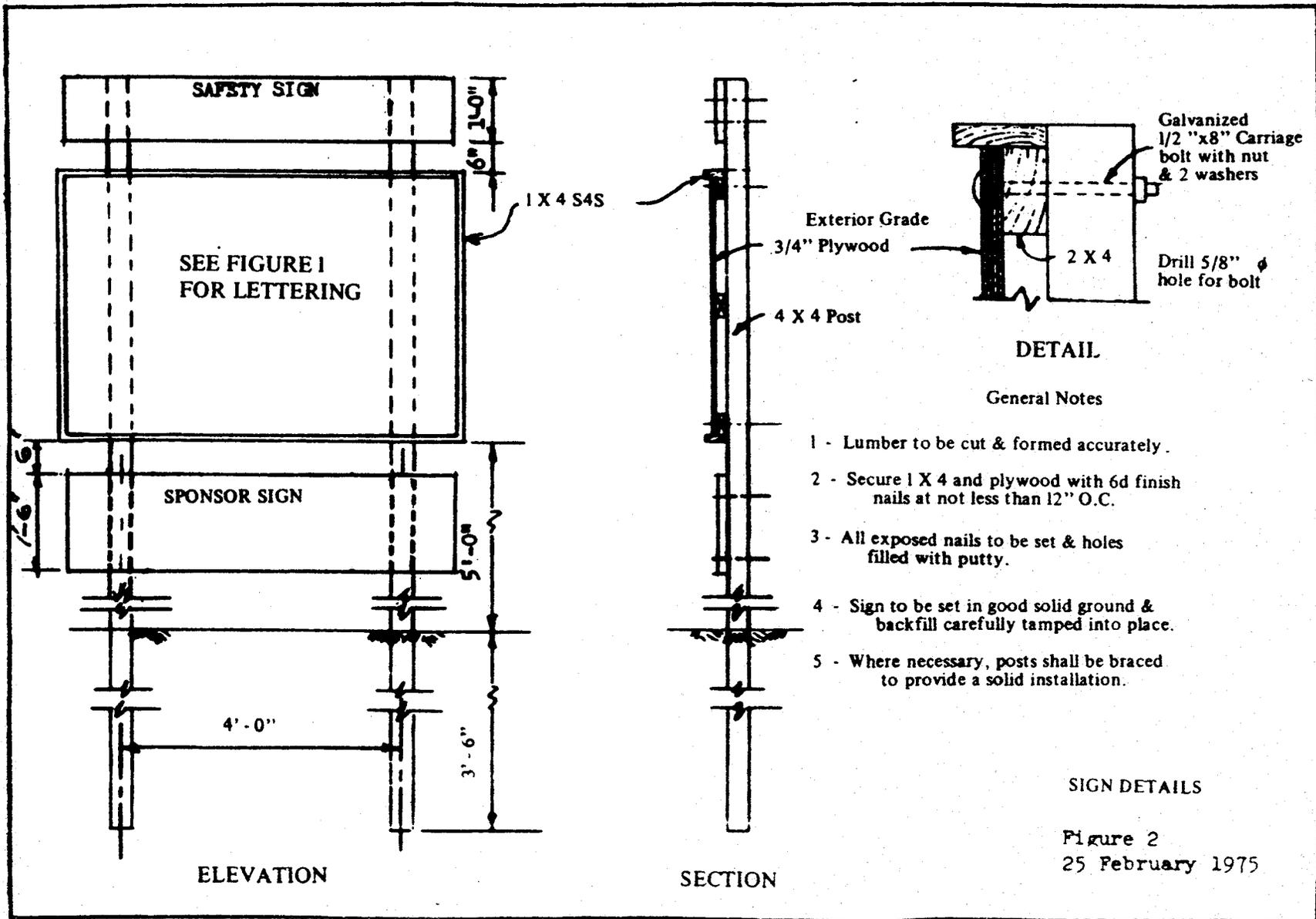
SCHEDULE

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

Lettering Color -- Black

PROJECT SIGN  
(Army-Civil Works)

Figure 1  
14 August 1972



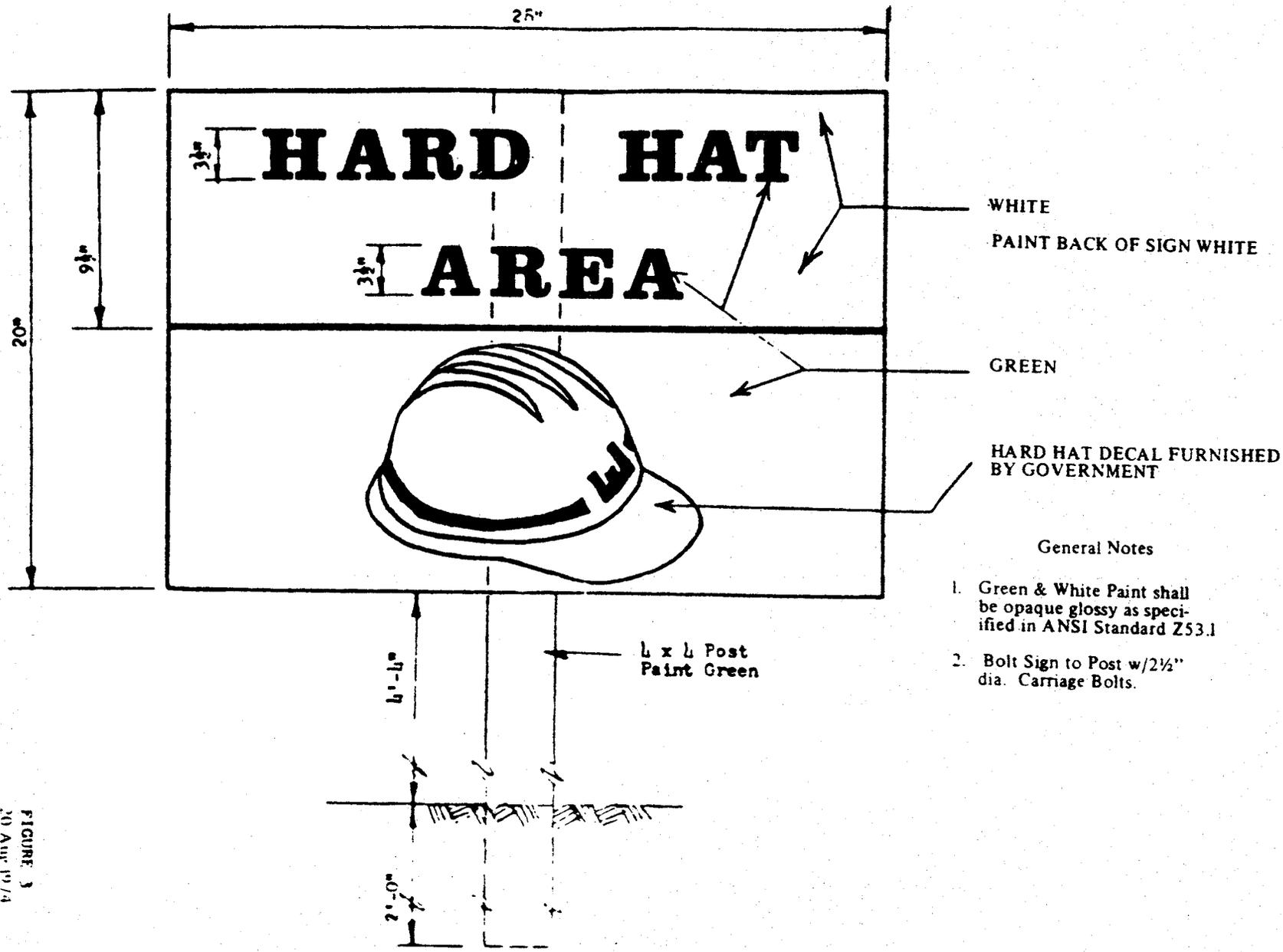


FIGURE 3  
20 Aug. 1974

SECTION 1B

MEASUREMENT AND PAYMENT

Index

- |  |  |
|--|--|
| 1. Diversion and Control of Water          | 11. Grouting Stone Protection              |
| 2. Clearing Site and Removing Obstructions | 12. Bridge Pier Modification               |
| 3. Excavation                              | 13. Drainage Channel (Side Drain)          |
| 4. Fills                                   | 14. Side Drain Box Culvert                 |
| 5. Concrete                                | 15. Asphalt Concrete Pavement              |
| 6. Portland Cement                         | 16. Fencing                                |
| 7. Steel Reinforcement                     | 17. Guardrail                              |
| 8. Bedding Material                        | 18. Topsoil Fill                           |
| 9. Stone                                   | 19. Seeding                                |
| 10. Stone Protection                       | 20. Remove and Replace Existing Protection |
|  | 21. Corrugated Metal Pipe and Pipe Arch    |

1. DIVERSION AND CONTROL OF WATER. Payment for Diversion and Control of Water, Skunk Creek and Diversion and Control of Water, Overlook Road will be made at the applicable contract prices which payments shall constitute full compensation for diversion and control of water in the channels and other work areas adjacent to the overlook road, complete.

2. CLEARING SITE AND REMOVING OBSTRUCTIONS.

2.1 General. Payment shall include all costs for clearing and removal work (except work by others) including all existing obstructions within the channel and rights-of-way and construction easement. Except as otherwise specified, payment for clearing and removal work includes; filling holes, removing and plugging abandoned pipe or conduit, removal of materials for salvage; protection of utilities, fences, walls, and features indicated to remain; and the disposal of all removed materials.

2.2 Payment for Clear Site and Removing Obstructions, Skunk Creek and Clear Site and Remove Obstructions, Overlook Road will be made at the applicable contract prices, which payments shall constitute full compensation for clearing site and removing obstructions and protection work, complete. Excluded from these items are removal of existing A-C pavement and stone for which separate payment is included.

2.3 Payment for Remove Existing Asphalt Concrete Pavement will be made at the applicable contract price, which payment shall constitute full compensation for removing and disposing of the existing pavement, including and saw cutting or pavement breaking and appurtenant work, complete.

3. EXCAVATION.

3.1 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 and the ground surfaces as indicated by the above mentioned survey. The actual slopes as excavated may be greater or less than those indicated, depending on the materials excavated and methods used in performing the

work, but such alterations shall not change the measurement for payment from the original lines as specified herein. The quantity of directed excavation necessary for the removal of unsuitable foundation material as specified shall be included in the measurement of the excavation where the unsuitable soils are encountered. Quantities will be computed in cubic yards by the average end area method and the planimeter will be considered a precise instrument for measurement of plotted cross sections. All excavation outside of excavation lines shown on the drawings will be considered as being for the convenience of the Contractor.

### 3.2 Payment.

3.2.1 Payment for Excavation, Channel will be made at the applicable contract price, which payment shall constitute full compensation for excavation and disposal of excavated materials, complete. This item includes the excavation for invert, walls, wall footings, and appurtenant work.

3.2.2 Payment for Excavation, Toe will be made of the applicable contract price, which payment shall constitute full compensation for excavation and disposal of excavated material, complete.

3.2.3 Payment for Excavation, Road will be made at the applicable contract price, which payment shall constitute full compensation for excavation and disposal of excavated material, complete.

3.2.4 Unsuitable Soils. No separate payment will be made for the excavation and disposal of unsuitable soils. When such excavation is directed, payment therefore will be included in the applicable contract price for the items of work under which the unsuitable soils are encountered. When there is not applicable contract item an adjustment will be made.

### 4. FILLS.

4.1 Measurement for payment for fills 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.

4.2.1 Payment for Compacted Fill, Levee and Compacted Fill, road contract prices which payments shall constitute full compensation for placing and compacting the fills, complete.

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

4.2.3 Payment for Backfill, Toe will be made at the applicable contract price, which payment shall constitute full compensation for obtaining placing and compacting the fill, complete.

4.2.4 Payment for Miscellaneous Fill will be made at the applicable contract price, which payment shall constitute full compensation for placing and compacting the fill, complete.

4.2.5 Trenches. No separate payment will be made for backfilling for pipelines. All costs in connection therewith shall be included in the contract price for the items to which the work applies.

4.2.6 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.

#### 5. CONCRETE.

5.1 Measurement of Concrete will be made on the basis of the actual volume of concrete within the pay lines of the invert, walls, wall footings, and cut off walls, and appurtenant work as indicated. Measurement of concrete placed against the sides of any excavation without the use of intervening forms will be made only within the pay lines of the structure. No deductions will be made for rounded or beveled edges or space occupied by metal work, nor for voids or embedded items which are either less than 5 cubic feet in volume or one square foot in cross section. Concrete wasted or used for the convenience of the Contractor will not be included in the measurement.

5.2 Payment for Concrete will be made at the applicable contract prices for the various items of the schedule, which payments shall constitute full compensation for labor, materials (except cement and reinforcement for which separate payment is provided), and for all equipment and tools required to complete the concrete work. Embedded items shall be included in the cost of the concrete except when other payment is specifically provided. No payment will be made for concrete placed in structures for which payment is made on a lump sum basis.

#### 6. PORTLAND CEMENT.

6.1 Measurement. The quantity of Portland Cement to be paid for will be the number of hundred-weight (100 pounds) of cement used in the concrete paid for on a cubic yard basis unless wasted or used for the convenience of the Contractor. The quantity to be paid for will be determined by multiplying the approved batch weight of the cement by the number of batches of concrete of the types placed within the pay lines of the structures and dividing by 100.

6.2 Payment for Portland Cement will be made at the applicable contract price, which payment shall constitute full compensation for furnishing the Portland cement complete, ready for use in the work. Payment will not be made for Portland cement used in concrete for lump sum items.

#### 7. STEEL REINFORCEMENT.

7.1 Measurement of reinforcement in concrete structures paid on a cubic yard basis will be made of the lengths of bars actually placed in the completed work in accordance with the drawings, approved bar schedules, or as directed. The measured lengths will be converted to weights for the bar numbers listed by the use of the unit weights per linear foot contained in ASTM A 615. Steel in laps indicated on the drawings or required by the Contracting Officer will be measured. Longitudinal steel for channel invert and side slopes will be measured on the basis of the use of 60 foot bar lengths. No measurement will be made for the additional steel in laps which are authorized for the convenience of the Contractor. No measurement will be made of steel supports and spacers. All costs for furnishing and installing supports and spacers shall be included in the various items with the reinforcement.

7.2 Payment for Steel Reinforcement will be made at the applicable contract price, which payment shall constitute full compensation for furnishing and placing the reinforcement, complete.

#### 8. BEDDING MATERIAL

8.1 Measurement. The quantity to be paid for will be the number of cubic yards of bedding material acceptably placed in the completed work, measured to the lines and grades shown on the drawings, or as directed.

8.2 Payment for Bedding Material will be made at the applicable contract price, which payment shall constitute full compensation for the obtaining and placing the bedding material, complete, in place.

#### 9. STONE.

9.1 Measurement. The quantity of stone to be paid for will be the number of tons, of the various types of stone, determined by scale weights acceptably placed within the lines and grades indicated on the drawings or directed by Contracting Officer.

9.2 Payment for the various types of stone will be made at the applicable contract prices, which payments shall constitute full compensation for the obtaining and placing stone, complete, in place.

#### 10. STONE PROTECTION.

10.1 Measurement. The quantity to be paid for will be the number of cubic yards of cobblestone (stone to be grouted) acceptably placed in the completed work, measured to the lines and grades shown on the drawings, or as directed.

10.2 Payment for Stone Protection will be made at the applicable contract price, which payment shall constitute full compensation for obtaining and placing the stone protection (cobblestones), complete, in place.

#### 11. GROUTING STONE PROTECTION.

11.1 Measurement. The quantity of grout to be paid for will be measured to the nearest cubic yard by weighing all ingredients in trial batches of grout and converting each batch to absolute volume; the volume thus determined and the number of batches of grout of corresponding proportions, acceptably placed in the work, shall be used to determine the quantity of grout.

11.2 Payment for Grouting Stone Protection will be made at the applicable contract price, which payment shall constitute full compensation for grouting the Stone Protection (except for Portland cement), including placing and curing, complete.

12. BRIDGE PIER MODIFICATION. Payment for Bridge Pier Modification will be made at the applicable contract price, which payment shall constitute full compensation for constructing the pier nosings, complete, including removal and replacement of invert and removal of cut-off wall, excavation and backfill, complete, between Sta. 104+10.69 and Sta. 102+90.85.

13. DRAINAGE CHANNEL (SIDE DRAIN). Payment for Drainage Channel will be made at the applicable contract price, which payment shall constitute full compensation

for construction of the drainage channel (side drain) including applicable earthwork, reinforced concrete trapezoidal channel, and connections to other structures, complete.

14. SIDE DRAIN BOX CULVERT. Payment for Side Drain Box Culvert will be made at the applicable contract price, which payment shall constitute full compensation for the box culvert complete, including excavation, fill, and concrete. The excavation and fill included shall be only that which is located outside the limits of other excavation and fill for which separate payment is provided.

15. ASPHALT CONCRETE PAVEMENT.

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

15.2 Payment for Asphalt Concrete Pavement, Skunk Creek and Asphalt Concrete Pavement, Overlook Road will be made at the applicable contract prices, which payments shall constitute full compensation for asphalt concrete surfacing, complete including weed killer where required, prime coat, tack coat, subgrade preparation and appurtenant work.

16. FENCING.

16.1 Measurement of Fencing will be made to the nearest linear foot horizontally along the centerline from end-to-end of the fence in place.

16.2 Payment for Fencing, Chain-Link and Fencing, Barbed Wire will be made at the applicable contract price, which payment shall constitute full compensation for the fencing, complete. Payment will not include gates.

16.3 Gates. Payment for Double Drive Gates will be made at the applicable contract price, per each, which payment shall constitute full compensation for the gates, complete.

17. GUARDRAIL.

17.1 Measurement of Guardrail will be based on the actual linear feet of railing acceptably furnished and installed. Measurement will be to the nearest linear foot measured horizontally along the centerline from end-to-end of the railing.

17.2 Payment for Guardrail will be made at the applicable contract price, which payment shall constitute full compensation for the railing, complete. Payment for Guardrail includes furnishing and installing posts and applicable earthwork.

18. TOPSOIL FILL.

18.1 Measurement for payment of Topsoil Fill will be made between the finished levee slope line or excavation and the fill limit lines as indicated. Quantities will be computed in cubic yards by the average end area method and the planimeter will be considered a precise instrument for measuring plotted cross sections.

18.2 Payment for Topsoil Fill will be made at the applicable contract price, which payment shall constitute full compensation for obtaining, stockpiling, placing and compacting the fill, complete.

19. SEEDING.

19.1 Measurement. The unit of measurement for Seeding will be the acre. The quantity of seeding to be paid for will be the actual acreage seeded as specified, computed to the nearest 1/10 of an acre.

19.2 Payment for Seeding will be made at the applicable contract price, which payment shall constitute full compensation for the seeding, complete.

20. REMOVE AND REPLACE EXISTING STONE PROTECTION. Payment for Remove and Replace Existing Stone Protection will be made at the applicable contract price, which payment shall constitute full compensation for removing existing stones, stockpiling, and replacing the stones where indicated, complete.

21. CORRUGATED METAL PIPE AND PIPE ARCH.

21.1 Measurement of Corrugated Metal Pipe and Pipe Arch will be based on the actual linear feet of pipe acceptably furnished and installed. Measurement will be made to the nearest linear foot, measured horizontally along the centerline, from end-to-end of the pipe.

21.2 Payment for Corrugated Metal Pipe and Pipe Arch of the sizes indicated will be made at the applicable contract prices, which payments shall constitute full compensation for the pipe, including excavation, preparation of subgrade or trench bottom, connections, backfill, and appurtenant work, complete.

\* \* \* \* \*

## SECTION 1D

### ENVIRONMENTAL PROTECTION

#### Index

- |   |  |
|---|--|
| 1. Scope                                    | 7. Post Construction Clean up                                |
| 2. Quality Control                          | 8. Restoration of Landscape<br>Damage                        |
| 3. Submittals                               | 9. Maintenance of Pollution<br>Control Facilities            |
| 4. Subcontractors                           | 10. Training of Contractor<br>Personnel in Pollution Control |
| 5. Notification                             |  |
| 6. Protection of Environmental<br>Resources | 11. Payment  |

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

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

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

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

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

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

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

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

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

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

(7) Traffic control plan.

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

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

(10) Plan of borrow area(s).

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

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

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

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

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

6.1.1 Work Area Limits. Prior to any construction the Contractor shall mark the areas that are not required to accomplish all work to be performed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

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

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

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

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

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

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

6.1.7 Borrow Areas on Government Property shall be managed to minimize erosion and to prevent sediment from entering nearby water courses or lakes.

6.1.8 Spoil Areas on Government Property shall be managed and controlled to limit spoil to areas designated on the drawings and prevent erosion of soil or sediment from entering nearby water courses or lakes.

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

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

\*6.1.10.1 Disposal of Solid Waste by Removal from Government Property. The Contractor shall transport all solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal.

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

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

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

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

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

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

6.3.3 Stream Crossings shall be controlled during construction. Crossings shall provide movement of materials or equipment which do not violate water pollution control standards of the Federal, State or local government.

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

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

6.5.1 Particulates. Dust particles, aerosols, and gaseous by-products from all construction activities, processing and preparation of materials, such as from asphaltic batch plants, shall be controlled at all times, including weekends, holidays and hours when work is not in progress.

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

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

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

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

6.6 Protection of Sound Intrusions. The Contractor shall keep construction activities under surveillance, and control to minimize damage to the environment by noise. The Contractor shall use methods and devices to control noise emitted by equipment to the levels shown in Table 1 (Insert Table).

7. POST CONSTRUCTION CLEAN UP. The Contractor shall clean up all area(s) used for construction.

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

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

10. TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL. The Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers, and instruments required for monitoring purposes) to ensure adequate and continuous environmental pollution control.

11. PAYMENT. No separate payment or direct payment will be made for the cost of the work covered under this section, and such work will be considered as a subsidiary obligation of the Contractor.

\* \* \* \* \*

## SECTION 2A

### DIVERSION AND CONTROL OF WATER

#### 1. REQUIREMENT.

1.1 General. All permanent construction shall be carried on in areas free from water. Water in varying quantities may be flowing in the work area at intermittent periods during the time allowed for completion of construction. Runoff from the watersheds is rapid and, during periods of rain, intermittent freshets may be expected. The responsibility of the Contractor for protection of work against waterflows is specified in paragraph: DAMAGE TO WORK of the SPECIAL PROVISIONS. At all locations where construction work is at a lower elevation than the elevation of the stream or ground water at the time of doing the work, suitable cofferdams or dikes, if necessary, shall be constructed, the construction area shall be dewatered prior to commencement of the work, and all subgrades, whether for earthfill, filter, stone, or concrete, shall be kept drained and free of water throughout the working period. Within 10 days after award of contract, the Contractor shall submit plans showing the methods he proposes to use to dewater each working area and control the water from rain, sheet flow and other surface water. The plans shall show the scheme of operations and a complete layout of drainage pipes, pumps, diversion channels, cofferdams, etc. The plans shall also take into consideration the following specific requirements.

#### 1.2 By-Pass Capacities.

1.2.1 General. The Contractor shall provide for diversion of stream flows hereinafter specified. The stream flows will include water originating upstream of the work, Water from side drains and channels adjacent to the work site, and will be in addition to any and all ground water originating within the work. Surface flows in excess of the following runoff quantities listed hereinafter will be regarded as floodflows.

#### 1.3 Flows from Skunk Creek Drainage Area.

1.3.1 Runoff Quantities During Period 1 April to 10 June and 1 October to 30 November-a streamflow of 10 cfs.

1.3.2 Runoff Quantities During Period 11 June to 30 September and 1 December to 31 March-22,000 cfs.

1.4 Drainage Ditches. The location and depth of any drainage ditch shall be subject to approval of the Contracting Officer. Special precaution shall be taken to avoid impairing the permanent subgrade; and any excavation below the existing streambed or invert subgrade shall be refilled with compacted fill in accordance with the section; FILLS AND SUBGRADE PREPARATION by and at the expense of the Contractor.

\* \* \* \* \*

## SECTION 2B

### CLEARING SITE AND REMOVING OBSTRUCTIONS

#### Index

1. Requirements
2. Disposal of Cleared and Grubbed Material
3. Protection and Support of Utilities

#### 1. REQUIREMENTS.

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

1.2 Existing Structures and Obstructions. The Contractor shall clear the site, including all fill and excavation areas, and remove and dispose of all existing structures and obstructions for channel and embankment construction, except as otherwise noted on the drawings. Obstructions which are designated or specified to be removed by others shall not be removed by the Contractor. Except as otherwise specified, obstructions designated to be removed by others will be removed in sufficient time to preclude interference with the Contractor's operations. Except as otherwise specified, incombustible waste material, such as broken concrete, pavement, and other like materials shall be considered scrap and shall not be used in fills.

1.3 Clearing. Trees less than 1-1/2 inches in diameter and other vegetation, except as specified, shall be cut off 6 inches below the indicated subgrade or ground level whichever is lower. Other vegetation shall be cut off flush or slightly below the original ground surface. Clearing operations shall be conducted so as to prevent damage to trees, structures, and installations under construction, or to remain in place, and to provide for the safety of employees and others. All rubbish, waste dumps, and debris areas shall be cleared with the channel right-of-way and work areas.

1.4 Grubbing shall consist of removing all trees, stumps, roots, logs, and other objectionable vegetable matter in the required fills, foundation areas, and all excavation areas. In grubbing out stumps and roots, all roots or other timber more than 1-1/2 inches in diameter shall be removed to 3 feet below the depth of the required excavation or existing ground level, whichever is lower. Trees and stumps shall be pulled, not cut off.

1.5 Obstructions to channel construction, except as indicated shall be removed within limits of excavation for new channel construction.

1.6 Filling of Holes. Holes made by removal of obstructions and grubbing operations shall be refilled to subgrade with compacted fill material as specified in the section: FILLS AND SUBGRADE PREPARATION.

1.7 Utilities. Prior to removing an obstruction, all applicable utility relocations shall have been relocated.

1.8 Concrete in existing construction, which will join new concrete or new construction, shall be saw cut to a depth of 2 inches and the concrete shall be removed in a manner to provide plane surface to which new concrete shall be bonded, unless otherwise specified.

1.9 The removal of materials for salvage shall be performed in a manner to avoid damage to such materials and to portions of the existing work to remain in place. The Contractor has the option of furnishing new fastenings and fittings in lieu of salvaging such material. Such new materials shall be the equivalent of existing materials.

1.10 Existing Structures within the rights-of-way and to remain shall be protected and supported as necessary during removal and construction operations.

2. DISPOSAL OF CLEARED AND GRUBBED MATERIAL. All material removed, except material specified and/or indicated to be salvaged, is designated as scrap, shall become the property of the Contractor, and shall be removed from the site. Disposal shall comply with all applicable Federal, State, and local laws.

3. PROTECTION AND SUPPORT OF UTILITIES.

3.1 General. The Contractor shall adequately support and protect from damage all existing utilities which are located within, or below, or close to the construction area and which are to remain in place.

\* \* \* \* \*

## SECTION 2C

### TOPSOIL FILL

1. GENERAL. Topsoil fill material shall be selected from actual excavation areas, borrow areas, or areas on which fills are to be placed where directed by the Contracting Officer. Topsoil fill shall consist of removal and stockpiling of the upper 6 inches, minimum (8 inches maximum) from the areas. Removal of topsoil from areas other than those directed by the Contracting Officer will not be permitted except where required for other work under this contract. Trees, turf, grass or vegetation which cannot be protected in place shall be removed from the topsoil fill prior to stockpiling.

2. MATERIAL. Topsoil fill shall consist of surface soil as specified herein including native grass, roots, weeds, stones or other natural materials, reasonably free of sticks and trash. All stones greater than 6 inches in size shall be removed prior to stockpiling. All roots, stumps or other wood material larger than 2 inches in diameter shall be removed prior to stockpiling.

#### 3. PLACEMENT OF TOPSOIL FILL.

3.1 Subgrade preparation. Fills for levee slopes shall be trimmed to the lines and grades indicated. Prior to placing topsoil fill, levee slopes shall be scarified to a depth of 2 inches.

3.2 Placement. Topsoil fill shall be placed with suitable equipment in a single layer which after compaction, shall not exceed 18 inches in depth, nor be less than 10 inches in depth.

3.3 Compaction. Material shall have a uniform, natural moisture content while being placed and compacted. Compaction equipment shall be capable of compacting the material and providing reasonably uniform, slope. No specific compaction effort is required, however, the finished slope shall remain furrowed.

4. DISPOSAL OF EXCESS TOPSOIL FILL. Excess topsoil fill suitable for required fills may be used as miscellaneous fill in the areas indicated or placed in the borrow area at the completion of the project. All topsoil fill not suitable for fills, and unsuitable material such as trash, oversize rocks and plant material shall be removed from the site and disposed of as specified in section: EXCAVATION. The Contractor shall notify the Contracting Officer in writing of his intentions for the placement of the excess topsoil fill 14 days prior to actual placement.

\* \* \* \* \*

## SECTION 2D

### EXCAVATION

#### Index

- |                              |                                     |
|------------------------------|-------------------------------------|
| 1. General                   | 7. Excavation for Roads             |
| 2. Blasting                  | 8. Excavation for Borrow            |
| 3. Preservation of Property  | 9. Removal of Unsatisfactory Soils  |
| 4. Excavation for Structures | 10. Disposal of Excavated Materials |
| 5. Excavation, Channel       | 11. Overcut                         |
| 6. Excavation, Toe           |                                     |

1. GENERAL. Excavation shall consist of the removal of every type of material encountered (except materials covered by the provisions of the sections: CLEARING SITE AND REMOVING EXISTING OBSTRUCTION and TOPSOIL in designated areas or from areas directed. The material to be removed may include but is not limited to earth, hardpan, silt, clay, gravel, cemented sand and gravel (caliche), rock, adobe, detached pieces of stone and concrete, rock fills, existing fills of miscellaneous debris and rubbish, and other unsuitable materials. Slope lines indicated on the drawings for temporary cuts do not necessarily represent the actual slope to which the excavation must be made to safely perform the work. Excavation for permanent cuts shall be made to the slope lines indicated. Excavation 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 1/2 inch from indicated grade.

2. BLASTING. Blasting will not be permitted.

3. PRESERVATION OF PROPERTY. All excavation operations shall be conducted in such a manner that street pavements, sidewalks, curbs, 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. 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.

4. EXCAVATION FOR STRUCTURES. Excavation within the vicinity of existing structures, utilities, and drainage pipes to remain in place shall be performed in a manner to prevent damage to the structure. Earth banks and facilities to remain in place shall be supported as necessary during excavation. In general, unless otherwise shown or specified, the actual side slopes will be at the Contractor's option.

5. EXCAVATION, CHANNEL. Channel excavation consists of the removal and disposal of all materials within the lines and grades indicated on the plans. Suitable materials may be used in the compacted fill portions of the required fill.

6. EXCAVATION, TOE. Toe excavation consists of the removal and disposal of all materials within the lines and grades indicated on the plans. Suitable materials may be used in the backfill and levee fill portions of the required fill.
7. EXCAVATION FOR ROADS. Road excavation consists of the removal and disposal of all materials within the lines and grades indicated on the plans. Suitable materials may be used in the compacted road embankment.
8. EXCAVATION FOR BORROW. Borrow material shall be obtained from the required excavation for the channel, levees roads and the designated borrow areas shown on the drawings. Excavation shall be accomplished using vertical or inclined cuts to produce a blended material in the borrow area. In general, suitable material from required excavation shall be exhausted before using borrow excavation. Obtaining borrow material shall include the necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris therefrom. Upon completion of the excavation in the borrow area, all excavated areas shall be rough-graded and gently sloped as approved.
9. REMOVAL OF UNSATISFACTORY SOILS. The removal of soils which are unsatisfactory for foundations of the channel, structures, roads and drains may be required in certain areas. 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: FILLS AND SUBGRADE PREPARATION.
10. DISPOSAL OF EXCAVATED MATERIALS. Excavated materials suitable for required fills shall be placed in temporary stock piles or used directly in the work. The miscellaneous fill areas are required fills and shall be filled in accordance with the requirements of the section: FILLS AND SUBGRADE PREPARATION. All excess materials suitable for fills shall be placed in the miscellaneous fill areas indicated on the drawings. Excavated materials with a high degree of caliche cementation may be used in required fills if blended with non-cemented materials and approved by the Contracting Officer. Excavated material not suitable for fills and unsatisfactory materials 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 expressed authority. Prior to placing material, the miscellaneous fill and stockpile 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 the sections: CLEARING SITE AND REMOVING EXISTING OBSTRUCTIONS and TOPSOIL. The stockpiles and disposal fills shall be placed in a manner to preclude ponding of water. Contractor shall furnish notice of his intentions in connection with the use of indicated disposal areas in accordance with the requirements of the paragraph: PUBLIC UTILITIES, NOTICES, and RESTRICTIONS of the GENERAL REQUIREMENTS. Upon completion of the work, all temporary stockpile areas shall be so graded that adequate drainage will be provided and shall be smoothly and evenly dressed and left in a neat and satisfactory condition in accordance with the sections: SEEDING and ENVIRONMENT PROTECTION.
11. 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 or concrete, and 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 bridge footings shall be backfilled with concrete.

## SECTION 2E

### FILLS AND SUBGRADE PREPARATION

#### Index

- |  |                          |
|--|--------------------------|
| 1. Applicable Publications   | 6. Compacted Fill, Roads |
| 2. Compaction Equipment  | 7. Backfills             |
| 3. General Requirements for Compacted<br>Fills and Compacted Backfills | 8. Miscellaneous Fill    |
| 4. Compacted Fill, Channel   | 9. Subgrade Preparation  |
| 5. Compacted Fill, Levee   |                          |

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

1.1 American Society for Testing and Materials (ASTM) Publications.

- |                  |  |
|------------------|--|
| D 698-78         | Moisture-Density Relations of Soils<br>Using a 5.5-Lb. Rammer and a 12-In.<br>Drop |
| D 1557-78        | Moisture-Density Relations of Soils<br>Using a 10-Lb. Rammer and an 18-In.<br>Drop |
| D 1556-64 (1974) | Density of Soil In-Place by the<br>Sand-Cone Method                                |

1.2 American Association of State Highway and Transportation Officials (AASHTO) Standards.

- |                 |  |
|-----------------|--|
| T 99-70         | Moisture-Density Relations of Soils<br>5.5-Lb. Rammer and a 12-In. Drop            |
| T 180-74        | Moisture-Density Relations of Soils<br>Using a 10-Lb. Rammer and an 18-In.<br>Drop |
| T 191-61 (1974) | Density of Soil In-Place by the<br>Sand-Cone Method                                |

2. COMPACTION EQUIPMENT.

2.1 General. All equipment, tools, and machines shall be maintained in satisfactory working condition at all times. Compaction equipment shall conform to the requirements specified herein and shall be used as indicated in subsequent paragraphs.

2.2 Tamping Rollers. Tamping rollers shall consist of two or more roller drums mounted side by side in a suitable frame. Rollers operated in tandem sets shall be towed in a manner such that the prints of the tamping feet produced by the tandem units do not overlap. Each drum of a roller shall have an outside diameter of not less than 5 feet and shall be not less than 5 feet nor more than 6 feet in length. The space between two adjacent drums, when on a level surface, shall be not less than 12 inches nor more than 15 inches. Each drum shall be free to pivot about an

axis parallel to the direction of travel. Each drum ballasted with fluid shall be equipped with at least one pressure-relief valve and with at least one safety head. The safety head shall be equal to Union Type Safety Heads as manufactured by Black, Sivalls and Bryson, Inc., Kansas City, Missouri, with rupture discs suitable for between 50 and 75 pounds-per-square-inch rupturing pressure. The pressure-relief valve is a manually operated valve and shall be opened periodically. Personnel responsible for opening pressure-relief valves shall be instructed to ascertain that valve openings are free from plugging to assure that any pressure developed in roller drums is released at each inspection. At least one tamping foot shall be provided for each 100 square inches of drum surface. The space measured on the surface of the drum, between the centers of any two adjacent tamping feet, shall be not less than 9 inches. The length of each tamping foot from the outside surface of the drum shall be not more than 11 inches and shall be maintained at not less than 9 inches. The cross-section area of each tamping foot shall be not more than 10 square inches at a plane normal to the axis of the shank 6 inches from the drum surface, and shall be maintained at not less than 7 square inches nor more than 10 square inches at a plane normal to the axis of the shank 8 inches from the drum surface. During the operation of rolling, the spaces between the tamping feet shall be maintained clear of materials which would impair the effectiveness of the tamping rollers. The weight of a roller when fully loaded shall be not less than 4,000 pounds per foot of length of drum. The weight of a roller empty shall be not more than 2,500 pounds per foot of length of drum. The loading used in the roller drums and operation of the rollers shall be as required to obtain the desired compaction. If more than one roller is used on any one layer of fill, all rollers so used shall be of the same type and essentially of the same dimensions. Rollers shall be drawn by crawler-type or rubber-tired tractors at a speed not to exceed 5.0 miles per hour. The use of rubber-tired tractors shall be discontinued if the tires leave ruts that prevent uniform compaction by the tamping roller. Tractors used for pulling rollers shall have sufficient power to pull the roller satisfactory when drums are fully loaded with sand and water. At the option of the Contractor, self-propelled tamping rollers conforming with the above requirements may be used in lieu of tractor-drawn tamping rollers. Self-propelled rollers exceeding the empty weight requirements may be used, provided that when the Contracting Officer determines self-propelled roller performance is unsatisfactory, the nominal foot pressure on the tamping feet of the self-propelled roller can be adjusted to approximate the nominal foot pressure of the specified towed rollers for the particular working condition required by the substitution of tamping feet having a face area not exceeding 14 square inches. If the self-propelled rollers cause shearing of the fill or laminations in the fill, the Contracting Officer may direct that the rollers be removed from the fill and that tractor-drawn tamping rollers conforming with these specifications be used. For self-propelled rollers, in which steering is accomplished through the use of rubber-tired wheels, the tire pressure shall not exceed 40 pounds per square inch. Self-propelled rollers shall be operated at a speed not to exceed 5.0 miles per hour. The design and operation of the tamping roller shall be subject to the approval of the Contracting Officer who shall have the right at any time during the prosecution of the work to direct such repairs to the tamping feet, minor alterations in the roller, and variations in the weight as may be found necessary to secure optimum compaction of the earth-fill materials.

2.3 Rubber-Tired Rollers shall have a minimum of 4 wheels equipped with pneumatic tires. The tires shall be of such size and ply as to be capable of being operated at tire pressures between 80 and 100 pounds per square inch at a 25,000-pound wheel load. The roller wheels shall be located abreast and be so designed that each wheel will carry approximately equal load in traversing uneven ground. The spacing of the wheels will be such that the distance between the nearest edges of

adjacent tires will not be greater than 50% of the rated tire width of a single tire at the operating pressure for a 25,000-pound wheel load. The roller shall be provided with a body suitable for such ballast loading that the load per wheel may be varied as directed by the Contracting Officer from 18,000 to 25,000 pounds. The roller shall be towed at speeds not to exceed 5 miles per hour. The character and efficiency of this equipment shall be subject to the approval of the Contracting Officer. If the rubber-tired rollers cause shearing of the fill or laminations in the fill, the Contracting Officer may direct that the rollers be removed from the fill and that tractor-drawn tamping rollers be used.

2.4 Vibratory Rollers shall have a total static weight of not less than 10,000 pounds with at least 90% of the weight transmitted to the ground through a single smooth drum when the roller is standing in a level position hitched to the towing vehicle. The diameter of the drum shall be between 5 and 5.5 feet, and the width between 6 and 6.5 feet. The unsprung weight of the drum, shaft, and internal mechanism shall not be less than 6,000 pounds. The frequency of vibration during operation shall be between 1,100 and 1,500 v.p.m., and the dynamic force shall be not less than 20,000 pounds at 1,400 v.p.m. The roller shall be towed at speeds not to exceed 1.5 miles per hour by a crawler tractor with a minimum drawbar rating of 50 horsepower. The Contractor shall submit to the Contracting Officer, from the equipment manufacturer, sufficient data, drawings and computations proving the conformance with the above requirements. The type and efficiency of this equipment will be subject to the approval of the Contracting Officer. Vibratory rollers may be self-propelled. Self-propelled vibratory rollers shall be operated at speeds not exceeding three miles per hour.

2.5 Mechanical Tampers. Compaction of Material, in areas where it is impracticable to use a roller, shall be performed by the use of approved mechanical tampers.

### 3. GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS.

3.1 Control. Moisture-density relations shall be established by the Contractor. Field density tests for compacted levee fills will be performed by the Government. The Contractor shall vary his operations where directed to allow the Contracting Officer to conduct in-place density tests. For all other required fills field density tests shall be performed by the Contractor in sufficient number and in such locations to insure that the specified density is being obtained. Moisture-density relations and field densities shall be reported on approved forms. One copy of density data less dry weight determinations shall be provided on the day each test is taken. The completed test reports shall be provided with the Contractor Quality Control Report on the work day following the test.

3.1.1 Laboratory Control. One moisture-density relation 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 the following requirements.

3.1.1.1 Outside of Street, Road, and Highway Rights-of-Way. AASHTO Standard T 99, Method D or ASTM Specification D 698, Method D, modified as specified hereafter.

3.1.1.2 Within Street, Road, and Highway Rights-of-Way. AASHTO Standard T 180, Method D, or ASTM Specifications D 1557, Method D, modified as specified hereafter.

3.1.1.2.1 All material over 3/4 inch in size will be removed and replaced with an equal portion of material between 0.187 inch, No. 4 sieve, and 3/4 inch in size.

3.1.1.2.2 A separate batch of materials will be used for each compaction test specimen. No materials will be re-used.

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

3.1.2 Field Control. Field in-place density shall be determined in accordance with AASHTO Standard T 191 or ASTM Specifications D 1556, except that in each test, the weight of the disturbed sample representing the full depth of layer shall be not less than 10 pounds for fine grain material and 12 pounds for coarse grain material using a scale for weighing of sufficient capacity and sensitive to .01 pounds. The density tests shall be well distributed and shall average not less than one test for each 500 cubic yards of material. At least one test shall be made in each 2 feet of compacted material processed as a unit and at least one test shall be made in each area.

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

3.2 Settling of Fills or Backfills with Water will not be permitted.

3.3 Material shall be obtained from the required excavations and borrow areas shall be free from sod, roots, brush, debris, trash or other objectionable material, and shall contain no stone whose greatest dimension is more than 3/4 of the layer thickness. Should tamping rollers be used the maximum stone size shall not exceed 3 inches. Materials shall have not less than 10 percent, by weight, passing the U.S. Standard No. 200 sieve.

3.4 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 2,500 p.s.i. when tested in accordance with the section: CAST IN PLACE STRUCTURAL CONCRETE. Heavy equipment shall not be operated over pipes and buried structures until at least 2 feet of fill material has been placed and compacted over them in conformance with the requirements of the paragraph: BACKFILL, PIPE TRENCHES. Compacted fill and backfill shall be placed with suitable equipment in horizontal layers which after compaction, shall not exceed 12 inches in depth for rubber-tired or vibratory rollers, 6 inches in depth for tamping rollers, and 4 inches in depth when mechanical tampers are used. The Contractor may vary the layer thickness within these limits for most efficient operations. Material containing

stones shall be placed in a manner to prevent the stones from striking the concrete structures and to prevent the formation of voids.

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

3.6 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 one foot of channel or structure walls or over buried structures until the compacted fill over the top of the structures has reached a depth of 2 feet. Compaction equipment shall be so operated that structures are not damaged nor overstressed during compaction operations. Mechanical tampers shall be used for compaction of fill material adjacent to structures where rolling equipment is impracticable for use in compaction.

#### 4. COMPACTED FILL, CHANNEL.

##### 4.1 Invert.

4.1.1 Preparation for Placing. Before placing material for compacted fill, the foundation surface shall be cleared of all existing obstructions, vegetation, and debris. Unsuitable material not meeting the requirements for fill material shall be removed where directed, and the existing surfaces scarified to a depth of 6 inches before placing the fill. Sloped ground surfaces steeper than one vertical to 4 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 fill layer.

4.1.2 Compaction. Each layer of the materials shall be compacted as specified herein for levee fill materials.

##### 4.2 Behind Channel Walls.

4.2.1 Limitations on Equipment. The gross weight of any piece of equipment, or the combined weight of any combinations of equipment coupled together, used to place, moisten and/or compact fill behind channel walls shall not exceed 35,000 pounds, including dynamic forces produced by vibratory equipment. Equipment used to compact the fill behind the channel walls shall be of such size as to be capable of operating in the area between the cut slope and the channel wall. Compaction equipment will not be required to operate at elevations lower than 4 feet above the top of wall footings. This equipment shall be of such size as to be capable of operating in the area between the cut slope and the channel wall at any point 4 feet above the top of the heel of wall footings.

4.2.2 Compaction. Each layer of fill behind channel walls shall be compacted to not less than 90% of maximum density.

4.2.3 Trimming. The berms top of fill adjacent to open channel walls shall be trimmed to the lines indicated on the drawings with a tolerance of plus or minus one inch. Any material loosened by trimming shall be recompacted and the berm area moistened and compacted with one pass of a smooth-wheeled roller. Tolerances shall apply after rolling. The fill slopes shall be trimmed to a uniform alinement at top of berm and to a reasonably uniform slope at or outside the lines shown on the drawings. The bridge approach areas other than paved areas shall be trimmed to a uniform alinement and reasonably uniform slopes.

#### 5. COMPACTED FILL, LEVEE.

5.1 Preparation for Placing shall conform to the requirements specified for preparation for placing fill material for the invert in the paragraph: COMPACTED FILL, CHANNEL. After removal of roots or other debris turned up in the process of stripping, the entire surface of the levee foundation area shall be scarified, moistened and compacted by 6 complete passes of the 50 ton rubber-tired roller.

5.2 Compaction. Fill material shall be compacted with tamping, vibratory rubber-tired rollers of the type hereinbefore specified to the extent that each layer of fill is traversed with a minimum of 8 complete passes of a tamping roller, a rubber tired roller, a minimum of 4 roller. A pass shall consist of one movement of the equipment specified over the area to be compacted. Rolling shall be done in such manner that the rollers overlap at least one foot over the fill strip previously rolled. Overlapping of previously rolled areas by one foot will not be considered as an extra pass over the fill area overlapped. If, by field tests made by the Government, it is determined that the desired compaction of any fill is not secured by the minimum number of passes specified, additional passes shall be made over the surface area of such designated portion. This procedure shall be repeated until the desired compaction is obtained. The Contractor shall have all additional rolling time certified at time of performance.

5.3 Trimming. The river side and top of levees shall be trimmed to the lines indicated on the drawing with a tolerance of plus or minus one inch, as measured perpendicular to the slope. Any material loosened by trimming shall be recompacted. The land side of levees shall be trimmed to a uniform alinement at top of levee and to a reasonably uniform slope at or outside the lines on the drawings. The ramps and bridge approach areas other than paved areas shall be trimmed to a uniform alinement and reasonably uniform slopes.

#### 6. COMPACTED FILL, ROADS.

6.1 Location. Compacted road fill shall consist of fill placed for new road construction, and all other fill and backfill within the road right-of-way.

6.2 Placing. The fill in back of or around street, road and highway bridges shall not be placed until 21 days after the deck has been placed or until the concrete has attained the required strength of 3,000 pounds per square inch when tested in accordance with the section: CAST IN PLACE STRUCTURAL CONCRETE.

6.3 Compaction. Each layer of road fill shall be compacted to not less than 90% of maximum density, except the upper 6 inches of fill shall be compacted to not less than 95% of maximum density.

6.4 Trimming. All shoulders and side slopes shall be neatly and accurately trimmed to the cross section indicated.

## 7. BACKFILLS.

### 7.1 Backfill and Fill About Structures.

7.1.1 Location. Backfill and fill shall consist of all fill against and/or around structures.

7.1.2 Material. Backfill and fill 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, silty sands, sandy silts, clayey sands, and sandy clays. Organic material, silt, clay, broken concrete or pavement, boulders and other unsuitable material shall not be used.

7.1.3 Placing. 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 2,500 p.s.i. when tested in accordance with section: CAST IN PLACE STRUCTURAL CONCRETE. Fill shall be placed in 4-inch layers.

7.1.4 Compaction shall be not less than 95% of maximum density.

7.2 Backfill, Toe shall consist of material placed over the toe stone protection. In general, the fill shall consist of material suitable for compacted fill placed in horizontal layers not more than 24 inches in thickness, smoothed and dressed to the lines and grades indicated, and compacted to not less than 90% maximum density.

8. MISCELLANEOUS FILL shall consist of material from the required excavation, placed in the area indicated, and shall be placed with suitable equipment in layers which shall not exceed 24 inches in depth before consolidation. Broken concrete, rock, and bituminous paving to be wasted may be buried in the larger miscellaneous fill areas, provided such material is placed in a manner that will prevent the formation of voids and provided it is placed not less than 2 feet below finished grade and not less than 2 feet horizontally from concrete construction. No depressions in which water might pond shall be left in miscellaneous fill areas. The finished areas shall be sloped to drain. Each layer of miscellaneous fill shall be compacted to not less than 90 percent of maximum density.

## 9. SUBGRADE PREPARATION.

9.1 Subgrade for Channel Invert. The native foundation materials will adequately support the channel invert provided the materials are not made spongy, weavy, ratty, or otherwise unstable by the action of the construction equipment. Where unstable conditions are encountered, the Contractor shall treat the foundation to provide a stable subgrade for operation of construction equipment and for subsequent placement of the channel invert. The treatment shall consist of removal and replacement with satisfactory materials from other sources. The depth and extent of required treatment will depend on the tire pressure, wheel loading; and frequency and repetition of loading by the construction equipment. Any material that is disturbed in-place, or any materials used to replace unstable material, shall be compacted to at least 95% of maximum density. Prior to placement of the channel invert, the entire invert subgrade for the channel shall be trimmed to a uniform grade. The finished surface of the subgrade shall not be more than 1 1/2 inches from the indicated grade at any point when tested with a 10-foot straightedge.

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

\* \* \* \* \*

## SECTION 2F

### AGGREGATE BASE

#### Index

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| 1. Applicable Publications           | 9. Mixing and Placing Materials   |
| 2. Materials                         | 10. Layer Thickness               |
| 3. Sampling and Testing              | 11. Compaction                    |
| 4. Equipment                         | 12. Edges of Base Course          |
| 5. Operation of Pits or Quarries     | 13. Smoothness Test               |
| 6. Weather Limitations               | 14. Thickness Control             |
| 7. Preparation of Underlying Surface | 15. Maintenance                   |
| 8. Grade Control                     | 16. Waybills and Delivery Tickets |

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

1.1 American Society for Testing and Materials (ASTM) Publications.

C 117-80	Materials Finer than No. 200 (76-UM) Sieve in Mineral Aggregates by Washing
C 127-77	Specific Gravity and Absorption of Coarse Aggregate
C 128-79	Specific Gravity and Absorption of Fine Aggregate
C 131-76	Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
C 136-76	Sieve or Screen Analysis of Fine and Coarse Aggregates
D 75-71 (R 1978)	Sampling Aggregates
D 422-63 (R 1972)	Particle-Size Analysis of Soils
D 423-66 (R 1972)	Liquid Limit of Soils
D 424-59 (R 1971)	Plastic Limit and Plasticity Index of Soils
D 1556-64 (1974)	Density of Soil In Place by the Sand-Cone Method
D 1557-78	Moisture-Density Relations of Soils, Using 10-lb. (4.5-kg) Rammer and 18-in. (457-mm) Drop
E 11-70 (R 1977)	Wire-cloth Sieves for Testing Purposes

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

2.1 Coarse Aggregate conforming to the requirements specified above shall have a percentage of wear not to exceed 50 percent after 500 revolutions. Slag shall be an air-cooled blast-furnace product having a dry weight of not less than 65 pounds per cubic foot. Coarse aggregate shall consist of angular fragments reasonably uniform in density and quality. The amount of flat and elongated particles shall not exceed 30 percent. A flat particle is one having a ratio of width to thickness greater than 3, and an elongated particle is one having a ratio of length to width greater than 3.

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

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

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

Sieve Designation	Percentage by Weight Passing Square-Mesh Sieve
1-inch	100
3/4-inch	90-100
1/4-inch	45-75
No. 200	2-9

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

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

3.1 Samples shall be of the size required and shall be taken by the Contractor. Copies of test results shall be submitted for approval 14 days prior to starting the work, and thereafter at regular intervals during production as specified hereinafter. These samples shall be obtained at the source, from test pits, borings, trucks, stockpiles, or from other designated locations. Samples for material gradation, liquid-limit determination, and plasticity-index tests shall be taken in conformance with ASTM D 75. After the material has been placed and compacted, samples for density tests shall be taken as specified in ASTM D 1556, and additional samples for gradation, liquid-limit, and plasticity-index tests shall be taken by an appropriate method. Where deemed necessary, the sampling will be supervised by the Contracting Officer. The Contractor shall arrange his work so that sampling and testing may be performed without interruption.

3.2 Tests.

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

3.2.2 Liquid Limit shall be determined in accordance with ASTM D 423.

3.2.3 Plasticity Index shall be determined in accordance with ASTM D 424.

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

3.2.5 Field In-Place Density shall be determined in accordance with ASTM D 1556. Moisture-density relations shall be established in the laboratory in accordance with ASTM D 1557, method D.

3.3 Testing Frequency. Results of tests to determine particle shape, presence of objectionable and foreign matter, percentage of wear, fracture count, gradation, liquid-limit, plasticity-index, specific gravity, and other specification requirements for determination of the acceptability of the source shall be submitted for approval at least 7 days prior to starting of manufacture of the base course material. Production testing for material gradation, liquid limit, and plasticity index shall be performed at regular intervals with at least one test being made for each 500 cubic yards or fraction thereof, of material produced and results shall be submitted on a daily basis. Deviations from specification requirements shall be corrected immediately upon discovery. After the material has been placed and compacted, one field density test for each 1,000 square yards or fraction thereof of finished base course and one additional gradation, liquid-limit, and plasticity index test for each 3,000 square yards of base course or fraction thereof shall be performed. Maximum-density moisture relations shall be established for each 4,000 square yards of base course material. The location of the after-placement tests shall be as directed. One copy of density data (less dry weight determinations) shall be provided on the day each test is taken. The completed test report shall be provided with the Contractor Quality Control Report on the following work day. Results of all tests made shall be submitted for approval on a daily basis and subsequent paving operations shall not commence until final approval has been obtained. Failure of any test shall be reported verbally, by the most expeditious means and followed promptly by written report. Contractor field operations shall immediately reflect corrective measures. For every failing test, retesting after completion of corrective measures have been taken will be required.

3.4 Approval of Materials. The source of the material shall be selected 14 days in advance of the time materials will be required in the work. Tentative approval of the preliminary reports submitted by the Contractor and the source will be based on an inspection by the Contracting Officer. Tentative approval of the materials will be based on test samples as specified herein. Final approval of both the source and the materials will be based on specified tests performed on samples taken from the completed and compacted base course.

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

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

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

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

8. GRADE CONTROL. During construction the lines and grades including crown and cross slope indicated for the aggregate base course shall be maintained by means of line and grade stakes placed by the Contractor at the worksite in accordance with SPECIAL PROVISIONS of these specifications.

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

of water, and to insure a satisfactory aggregate base course meeting all the requirements of this specification.

10. LAYER THICKNESS. The compacted thickness of the aggregate base course shall be as indicated. When a compacted layer of 6 inches is indicated, the material may be placed in a single layer. When a compacted layer thickness of more than 6 inches is indicated, the material shall be placed in two layers of approximately equal thickness.

11. COMPACTION. Each layer of the aggregate base course (including shoulders) shall be compacted with approved compaction equipment. Water content shall be maintained at optimum or at the percentage specified during compaction. In places not accessible to the rollers, the mixture shall be compacted with mechanical tampers. Compaction shall continue until each layer through the full depth is compacted to at least 100 percent of maximum density. The Contractor shall make such adjustments in rolling or finishing procedures as may be required to obtain true grades, to minimize segregation and degradation, to reduce or accelerate loss or gain of water, and to insure a satisfactory aggregate base course. Unsatisfactory materials shall be reworked to produce a satisfactory material.

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

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

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

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

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

\* \* \* \* \*

SECTION 2G

PRIME COAT AND WEED KILLER

Index

- |                            |                                       |
|----------------------------|---------------------------------------|
| 1. Applicable Publications | 6. Equipment                          |
| 2. Bituminous Materials    | 7. Preparation of Surface             |
| 3. Sampling and Testing    | 8. Weed Killer                        |
| 4. Quantity To Be Applied  | 9. Application of Bituminous Material |
| 5. Weather Limitations     | 10. Waybills and Delivery Tickets     |

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

1.1 American Society for Testing and Materials (ASTM) Publications.

D 140-70 Sampling Bituminous Materials  
(R 1976)

D 1250-80 Petroleum Measurement Tables

D 2027-76 Cutback Asphalt (Medium-Curing Type)

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

3. SAMPLING AND TESTING.

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

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

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

4. QUANTITY TO BE APPLIED. Bituminous material for the prime coat shall be applied in quantities of not less than 0.15 gallon nor more than 0.4 gallon per squared yard of the surface to be primed. Application of prime coat shall be divided, if necessary, into a 2 applications to avoid flowing off the surface. The exact quantities which may be varied to meet field conditions shall be determined by the Contractor and approved.

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

## 6. EQUIPMENT.

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

6.2 Bituminous Distributor shall have pneumatic tires of such width and number than the load produced on the base surface shall not exceed 650 pounds per inch of tire width. The distributor shall be designed and equipped to distribute the bituminous material uniformly at even heat on variable widths of surface at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard with a pressure range of 25 to 75 pounds per square inch and with an allowable variation not to exceed 5 percent from any specified rate. Distributor equipment shall include a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gages, volume-measuring devices, adequate heaters for heating the materials to the proper application temperature, a thermometer to show the temperature of the tank contents, and a hose attachment suitable for applying bituminous material to spots unavoidably missed by the distributor. The distributor shall be equipped to circulate and agitate the bituminous material during the heating process.

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

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

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

8. WEED KILLER. A chemical weed killer shall be applied to subgrade surfaces of top of levees, roads and access ramps prior to application of the prime coat. The weed killer may be either a fire retardant non-corrosive, water soluble mixture of sodium chlorates and sodium borates, or dry, free flowing borax. The sodium chlorate-sodium borate mixture shall be applied in a water solution at a rate that will yield a minimum of one pound of sodium chlorate per 100 square feet of treated surface. The equipment used for application of the solution shall mechanically agitate and circulate the solution at all times application is in process. Borax shall be applied dry on a previously dampened subgrade at a rate to yield the equivalent of 3 pounds of boron trioxide (B roll down, 2 roll up, 0, 3,) per 100 square feet of treated surface. After application of the borax, the area shall be uniformly sprinkled with water. The quantity of water applied in the solutions or after application of dry borax shall be at least 4 gallons per 100 square feet of treated surfaces.

9. APPLICATION OF BITUMINOUS MATERIAL. Immediately following the preparation of the surface, the bituminous material shall be applied by means of a bituminous distributor. The bituminous material shall be applied at a pressure within the range of 25 to 75 pounds per square inch and in the amounts as directed. The bituminous material shall be so applied that uniform distribution is obtained at all points of the surface to be treated. Unless the distributor is equipped to obtain satisfactory results at the junction of the previous and subsequent application, building paper shall be spread on the surface of applied material for a sufficient distance back from the ends of each application so that flow from the sprays may be started and stopped on the paper, and all sprayers operate at full force on the surface to be treated. Immediately after the application, building paper shall be removed and destroyed. Spots unavoidably missed by the distributor shall be properly treated with bituminous material. Following the application of bituminous material, the surface shall be allowed to dry without being disturbed for a period of not less than 48 hours, or longer as necessary to attain penetration into the foundation course and evaporation of the volatiles from prime material. The Contractor shall furnish and spread enough approved sand to blot up effectively and cure any excess bituminous material. The Contractor shall maintain the primed surface until the succeeding layer of pavement is placed by protecting the surface against damage and by repairing and repriming deficient areas at no additional cost to the Government. No smoking, fires, or flames other than heaters that are a part of the equipment shall be permitted in the vicinity of heating, distributing, or transferring operations of bituminous material.

9.1 Application Temperature shall be as directed and shall provide an application viscosity between 40 and 120 centistokes, kinematic, or 20 and 60 seconds, Saybolt-Furol. Application temperatures shall be within the following ranges, except that appropriate changes should be made when the ranges of viscosity is raised or lowered.

MC-70

120-190 degrees F.

The temperature-viscosity relationship shall be furnished to the Contracting Officer.

10. WAYBILLS AND DELIVERY TICKETS. Copies of waybills or delivery tickets shall be submitted during the progress of the work. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified waybills and/or certified delivery tickets for all bituminous material actually used in the construction of pavement covered by this section of the specification. The Contractor shall not remove bituminous material from the tank car or storage tank until the initial outage and temperature measurements have been taken by the Contracting Officer; nor shall the Contractor release the car or storage tank until the final outage has been taken by the Contracting Officer.

\* \* \* \* \*

## SECTION 2H

### ASPHALT CONCRETE

#### Index

- |                            |  |
|----------------------------|--|
| 1. Applicable Publications | 9. Treatment of Underlying Surface       |
| 2. Description             | 10. Transportation of Bituminous Mixture |
| 3. Aggregates              | 11. Placing                              |
| 4. Bituminous Material     | 12. Compaction of Mixture                |
| 5. Aggregate Gradation     | 13. Joints                               |
| 6. Composition of Mixture  | 14. Protection of Pavement               |
| 7. Mixing Plant            | 15. Surface Requirements                 |
| 8. Other Equipment         | 16. Sampling                             |

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

1.1 American Association of State Highway Officials (AASHO) standard.

M 226-78

Viscosity Graded Asphalt Cement

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

C 117-80

Materials Finer Than No. 200 (76  $\mu$ m)  
Sieve in Mineral Aggregates by  
Washing

C 127-77

Specific Gravity and Absorption of  
Coarse Aggregate

C 128-79

Specific Gravity and Absorption of  
Fine Aggregate

C 136-76

Sieve or Screen Analysis of Fine  
and Coarse Aggregates

D 242-70 (R 1975)

Mineral Filler for Bituminous  
Paving Mixtures

D 1559-76

Resistance to Plastic Flow of  
Bituminous Mixtures Using  
Marshall Apparatus

1.3 Military Standard.

MIL-STD-620A  
& Notice 1

Test Methods for Bituminous Paving  
Materials

2. DESCRIPTION. Asphalt concrete indicated as "A.C." shall consist of fine and coarse aggregates and mineral filler, if required, uniformly mixed with hot bituminous material, and placed and compacted on a prepared subgrade.

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

4. BITUMINOUS MATERIAL to be mixed with the mineral aggregates shall be asphalt cement conforming to AASHO M226, viscosity grade AR-40 Table 3.

5. AGGREGATE GRADATION. The aggregate gradation as determined by ASTM C 117 and C 136 and as selected by the Contracting Officer shall conform to one of the following.

Sieve Openings	Percentage by Weight, Passing		
	a	b	c
1 inch	100	-	-
3/4 inch	90-100	100	-
1/2 inch	-	90-100	100
3/8 inch	70-85	80-95	80-95
No. 4	50-65	55-72	55-73
No. 8	38-53	40-55	45-60
No. 50	12-26	14-27	17-30
No. 200	4-8	4-8	4-9

6. COMPOSITION OF MIXTURE.

6.1 Job-Mix Formula shall be submitted by the Contractor, and no bituminous mixture shall be manufactured until it has been approved. The formula will indicate the percentage of each sieve fraction of aggregate, percentage of asphalt, and temperature of the mixture as discharged from the mixer. The percentage of asphalt in the job-mix formula will be between 5.0 percent and 8.5 percent. Samples of the aggregates and asphalt shall be submitted for approval with the job-mix formula.

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

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

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

6.3.1 Addition of heat-stable additives to bitumen.

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

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

#### 8. OTHER EQUIPMENT.

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

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

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

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

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

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

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

10. TRANSPORTATION OF BITUMINOUS MIXTURE. The bituminous mixture shall be transported from the mixing plant to the site in trucks having tight, clean, smooth bodies with a minimum coating of concentrated solution of hydrated lime and water to prevent adhesion of the mixture. Each load of mixture shall be covered with canvas or other suitable material to protect the mixture from the weather and to prevent loss of heat. Mixtures having temperatures greater than 350 degrees, mixtures having temperatures less than 235 degrees, or mixtures which form or show

indications of moisture will be rejected. Hauling over freshly laid material will not be permitted.

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

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

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

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

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

16. SAMPLING. Sampling for the determination of thickness and density of the completed pavements will be performed by the Contracting Officer. All tests necessary to determine conformance with the specified requirements will be performed by the Contracting Officer without cost to the Contractor. The Contractor shall replace the pavement where samples are removed at his expense. No payment will be made for areas of pavement deficient in composition, density, or thickness until they are removed and replaced by the Contractor as directed by the Contracting Officer.

\* \* \* \* \*

## SECTION 2I

### SEEDING

#### Index

- |                                       |                             |
|---------------------------------------|-----------------------------|
| 1. Applicable Publications            | 5. Deleted                  |
| 2. Source Inspections                 | 6. Environmental Protection |
| 3. Submittals                         | 7. Materials                |
| 4. Delivery, Storage,<br>and Handling | 8. Installation             |

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

1.1 U.S. Department of Agriculture Federal Seed Act of August 9, 1939.

53 Stat 1275

Rules and Regulations

#### 2. SOURCE INSPECTIONS.

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

#### 3. SUBMITTALS.

3.1 **Samples.** Representative samples shall be taken from several locations on the area under consideration before work is started. At least four samples shall be taken at each location to be seeded.

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

a. Seed.

b. pH Adjuster.

3.3 **Certified Laboratory Test Reports.** In addition to the submittal of certificates specified herein, certified copies, in triplicate, of the reports of all tests listed below and required in referenced publications for the following materials shall be submitted for approval.

a. **Offsite Topsoil--for pH and residual herbicides.** The testing shall have been performed by an independent laboratory approved by the Contracting Officer within 30 days of submittal of reports for approval.

#### 4. DELIVERY, STORAGE, AND HANDLING.

##### 4.1 Delivery.

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

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

#### 4.2 Storage.

4.2.1 Seed shall be kept in dry storage away from contaminants, and in approved areas.

#### 5. DELETED.

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

#### 7. MATERIALS.

7.1 Seed. Seed shall be state-certified seed of the latest season's crop and shall be delivered in original sealed packages bearing the producer's guaranteed analysis for percentages of mixtures, purity, germination, weed-seed content, and inert material. No seed will be accepted with a date of test of more than 9 months prior to the date of delivery to the site. Seed shall be labeled in conformance with U.S. Department of Agriculture rules and regulations under the Federal Seed Act and applicable State seed laws. Seed that has become wet, moldy, or otherwise damaged will not be acceptable. Onsite seed mixing shall be done only in the presence of the Contracting Officer. Seed mixtures shall be as follows:

LBS PER ACRE	SPECIES COMMON NAME	BOTANICAL NAME
3 lbs	Lehman Lovegrass	Eragrostis Lehmaniana
2 lbs	Bursage	Ambrosia deltoideae
2 lbs	Creosote Bush	Larrea tridentata
2 lbs	Brittle Bush	Encelia farinosa
1 lbs	Indian Wheat	Plantago insularis
5 lbs	7 Day Grass	Schismus barbatus
7 lbs	Red Brome	Bromus Rubens
3 lbs	Filaree	Erodium cicutarium
2 lbs	Hairy Senna	Cassia Covesi

Maximum weed seed shall not exceed 1% by weight

#### 7.2 Topsoil.

7.2.1 Topsoil shall be the existing surface soil stripped on the site as described in Section: FILLS AND SUBGRADE PREPARATION.

7.2.2 If additional topsoil is required, it shall be furnished by the Contractor and shall be a natural, friable soil representative of productive soils in the vicinity. It shall be obtained from well-drained areas and shall be free of admixture of subsoil and foreign matter or objects larger than one inch in any dimension, toxic, substances, and any material or substance that may be harmful to plant growth. The pH range shall be 7.3 to 7.9. Topsoil that does not meet this pH range shall be amended by the addition of pH adjusters.

#### 7.3 pH Adjusters.

7.3.1 Gypsum shall be powdered, agricultural gypsum containing not more than 10 percent sulphur.

7.3.2 Aluminum sulfate shall be commercial grade.

7.4 Water. Water shall contain no elements toxic to plant life (and shall be obtained from existing water supply connections within the construction site.)

7.5 Herbicide shall be non-selective weed control, post emergence type with active ingredient not less than 10 percent diquat di-bromide.

7.6 Fertilizers shall be the type with application as follows:

16-20-0 -100 lbs. per acre  
20-20-10 -100 lbs. per acre

## 8. INSTALLATION.

8.1 Planting Seasons and Conditions. Planting shall be done within the following dates.

a. Seed shall be sown from 15 September to 15 December.

### 8.2 Seeding.

8.2.1 Hydroseeding. All areas that receive topsoil shall be hydroseeded. The seed, shall be mixed in the required amount of water to produce a homogeneous slurry and then uniformly applied under pressure at the rate as specified in paragraph: Seed.

### 8.3 Mulching.

8.3.1 Straw. All areas that have been seeded shall be mulched with straw. Straw shall be evenly blown over all areas at the rate of 3500 lbs. per acre. Straw shall be of the current season crop from barley or cereal grains.

8.3.2 Hydromulching. All areas that have been seeded shall be hydromulched, Immediately after the seeding and mulching with straw of each area, the contractor shall hydromulch the area with the following:

a. M145 Binder - 125 lbs. per acre

b. A Fiber - 200 lbs. per acre

8.4 Protection. The areas planted shall be protected against traffic or other use immediately after seeding is complete by placing warning signs, barricades and/or any other approved methods.

8.5 Restoration and Clean-Up. Excess and waste material shall be removed daily. When seeding in an area has been completed, the area shall be cleaned of all debris and excess material.

\* \* \* \* \*

## SECTION 2J

### CULVERTS

#### Index

- |                                      |   |
|--------------------------------------|---|
| 1. Applicable Publications           | 6. Excavation for Culverts<br>and Culverts Extensions |
| 2. Pipe for Culverts                 | 7. Bedding  |
| 3. Drainage Structures               | 8. Backfilling  |
| 4. Materials for Drainage Structures |   |
| 5. Corrugated Metal Pipe Joints      |   |

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

#### 1.1 Federal Specifications (Fed. Spec.).

WW-P-405a  
& Am-2

Pipe, Corrugated (Iron or Steel,  
Zinc Coated).

#### 1.2 Corps of Engineers Specification.

CRD-C 41-73

Air Content of Freshly Mixed Concrete  
by the Pressure Method

#### 1.3 American Association of State Highway and Transportation Officials (AASHTO), Standards.

T 180-70

Moisture-Density Relations of Soils  
Using a 10-lb (4.5 Kg) Rammer and  
an 18-in (457 mm) Drop

T 191-61

Density of Soil in Place by the Sand  
Cone Method

#### 1.4 American Society for Testing and Materials (ASTM), Publications.

C 94-78a

Ready-Mixed Concrete

C 141-67  
(R 1978)

Hydraulic Hydrated Lime for Structural  
Purposes

D 1556-64  
(R 1974)

Density of Soil in Place by the  
Sand-Cone Method

D 1557-78

Moisture-Density Relations of Soils,  
Using 10-lb. (4.5-Kg) Rammer and 18-  
in. (457-mm) Drop

D 1751-73 (1978)

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

## 2. PIPE FOR CULVERTS

2.1 Corrugated Steel Pipe and Pipe Arch. Fed. Spec. WW-P-405, Class I or II, Shape to mitch existing.

3. DRAINAGE STRUCTURES shall be of the following types, constructed of the materials specified for each type and in accordance with the indicated details.

3.1 Walls and Headwalls. Construction shall be of reinforced concrete or plain concrete, as indicated.

3.2 Flared End Sections. Sections shall be of a standard design with pipe manufacturer and manufactured of the same material as specified for the pipe. If approved, existing sections may be salvaged and re-used.

## 4. MATERIALS FOR DRAINAGE STRUCTURES.

4.1 Concrete. Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements of the section: CAST-IN-PLACE STRUCTURAL CONCRETE. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with CRD-C 41. The concrete covering over steel reinforcing shall be not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least three inches between steel and ground. Expansion-joint filler material shall conform to ASTM D 1751 and D 1752, or shall be resin impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

5. CORRUGATED METAL PIPE JOINTS. Space between pipe and connecting bands shall be kept free from dirt and grit so that corrugations fit snugly. The connecting band, while being tightened, shall be tapped with a soft-head mallet of wood, rubber, or plastic to take up slack and insure a tight joint. The annular space between abutting sections of part-paved and asbestos-treated pipe and pipe arch, in sizes 30 inches or larger, shall be filled with a bituminous material after jointing.

5.1 Standard Field Joints. Unless otherwise specified, field joints shall be made with outside bands, each band consisting of one or two pieces. The type, size, and gage of band and the size of angles and bolts shall be as specified in the applicable standards or specifications for the pipe.

6. EXCAVATION FOR PIPE CULVERTS AND CULVERT EXTENSIONS. Excavation and backfilling for culverts and culvert extensions shall be in accordance with applicable portions of sections. EXCAVATION AND FILLS AND SUBGRADE PREPARATION and the following requirements.

6.1 Trenching. Width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus twelve (12) inches to permit satisfactory jointing and through tamping of the bedding material under and around pipe. Sheeting and bracing where required shall be placed within the trench width as specified. Care shall be taken not to overexcavate. Where trench

widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures shall be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the Government.

6.2 Removal of Rock. Rock in either ledge or boulder formation shall be replaced with selected materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or one-half inch for each foot of fill over the top of the pipe, whichever is greater, but not more than three-fourths the nominal diameter of the pipe. Where bell-and-spigot pipe is used, the cushion shall be maintained under the bell as well as under the straight portion of the pipe.

6.3 Removal of Unstable Material. Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is encountered in bottom of trench, such material shall be removed to depth required and replaced to the proper grade with selected material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor in his performance of shoring and sheeting, water removal, or other specified requirements, resulting material shall be excavated and replaced.

7. BEDDING. The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. The pipe shall be bedded carefully in a soil foundation accurately shaped and rounded to conform to the lowest one-fourth of the outside portion of circular pipe, or to the lower curved portion of pipe arch for the entire length of pipe or arch. When necessary, the bedding shall be tamped. Bell holes and depressions for joints shall be only of such length, depth, and width as required for properly making the particular type joint.

#### 8. BACKFILLING.

8.1 Backfilling Pipe in Trenches. After the bedding has been prepared and the pipe installed, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. Care shall be taken to insure thorough compaction of the fill under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation of at least 12 inches above the top of the pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling, or compacted by mechanical rammers or tampers in layers not exceeding 12 inches. Tests for density shall be made as necessary to insure conformance to the compaction requirements specified in "Compaction" below. Where it is necessary in the opinion of the Constructing Officer, any sheeting and/or portions of bracing used shall be left in place, and the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or pavements.

8.2 Backfilling Pipe in Fill Sections. For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified above and in "Compaction" below. The fill material shall be uniformly spread in layers longitudinally on both sides of pipe, not exceeding six inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the

crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding 6 inches.

8.3 Movement of Construction Machinery. In compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert at any stage of the construction shall be at the Contractor's risk. Any pipe damaged thereby shall be repaired or replaced at the expense of the Contractor.

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

8.4.1 Minimum Density. Backfill over and around pipe, and backfill around and adjacent to all other drainage structures shall be compacted at the approved moisture content to the following applicable minimum density(ies) which will be determined as specified below in "Determination of Density."

8.4.1.1 Under paved roads, street, parking areas, and similar-use pavements including adjacent shoulder areas. Ninety percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.

8.4.1.2 Under unpaved or turfed traffic areas. Ninety percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

8.4.1.3 Under nontraffic areas. Density not less than that of surrounding material.

8.4.2 Determination of Density. Testing shall be the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to insure that specified density is being obtained and shall average not less than one test for each 200 lineal feet of trench for each 2 feet or less of backfill. At least one test shall be made in each trench.

8.4.2.1 Laboratory Control. The moisture-density relations shall be determined in a laboratory in accordance with AASHTO T 180, Method D, or ASTM D 1557, Method D, modified as follow:

8.4.2.1.2 All material over 3/4 inch in size shall be removed and replaced with an equal portion of material between 0.187 inch (No. 4 sieve) and 3/4 inch in size.

8.4.2.1.3 A separate batch of materials shall be used for the each compaction test specimen. No materials shall be re-used.

8.4.2.1.4 The desired amount of mixing water shall be added for each compaction test specimen, mixed well, and the mixture 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.

8.4.2.2 Field Control. Field in-place density shall be determined in accordance with AASHTO T 191 or ASTM D 1556, except that in each tests, the weight of the disturbed sample representing the full depth of layer shall be not less than 10 pounds for fine grain material and 12 pounds for coarse grain material using a scale for weighing of sufficient capacity and sensitive to .01 pounds.

\* \* \* \* \*

## SECTION 2K

### STONE PROTECTION

#### Index

- |                            |                                  |
|----------------------------|----------------------------------|
| 1. Applicable Publications | 4. Placement                     |
| 2. Materials               | 5. Scales                        |
| 3. Foundation Preparation  | 6. Waybills and Delivery Tickets |

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

C 88-76	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
C 127-77	Specific Gravity and Absorption of Coarse Aggregate
C 136-76	Sieve or Screen Analysis of Fine and Coarse Aggregates
C 131-76	Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
C 535-69 (R 1975)	Resistance to Abrasion of Large Size Coarse Aggregate by Use of the Los Angeles Machine

#### 2. MATERIALS.

2.1 Source and Material Approval. The Contractor shall make all arrangements, pay all royalties, and secure all permits for the procurement, furnishing and transporting of materials. The sources from which the Contractor proposes to obtain the material shall be selected and a sample submitted a minimum of 45 days in advance of the time when the material will be required in the work. Stone from a proposed source where exploratory investigations and compliance test reports or satisfactory service records are not available, will be tested by the Government for quality compliance. The Government will test one sample at its expense. If the material fails the tests or if the Contractor desires to utilize more than one source, additional testing will be accomplished by the Government for the sum of \$1000 for each sample tested. The costs of such tests will be deducted from payment due the Contractor. All test samples (500 pounds minimum) shall be representative of the rock source and shall be obtained by the Contractor under the supervision of the Contracting Officer and delivered at the Contractor's expense to the South Pacific Division Laboratory, U.S. Army Engineer Division, South Pacific, Susalito, California, 94965. A list of sources from which acceptable stone protection materials have been obtained is available for informational purposes in the office of the District Engineer, Geotechnical Branch, 300 North Los Angeles Street, Los Angeles, California 90012. Sources listed may no longer be available due to depletion or may not be acceptable because of changes in the material. The Contractor shall vary the quarrying, processing, loading and placing operations to secure the type and quality of stone protection specified. If the stone being furnished by the Contractor does not

fully meet all the requirements of these specifications, the Contractor shall furnish at no additional cost to the Government, other stone meeting the requirements of these specifications. Approval of stone from a source shall not be construed as a waiver of the right of the Government for the sum of \$1000 for each sample tested. The costs of such tests will be deducted from payment due the Contractor. All test samples (500 pounds minimum) shall be representative of the rock source and shall be obtained by the Contractor under the supervision of the Contracting Officer and delivered at the Contractor's expense to the South Pacific Division Laboratory, U.S. Army Engineer Division, South Pacific, Sausalito, California 94965. A list of sources from which acceptable stone protection materials have been obtained is available for informational purposes in the office of the District Engineer, Foundations and Materials Branch, 300 North Los Angeles Street, Los Angeles, California 90012. Sources listed may no longer be available due to depletion or may not be acceptable because of changes in the material. The Contractor shall vary the quarrying, processing, loading and placing operations to secure the type and quality of stone protection specified. If the stone being furnished by the Contractor does not fully meet all the requirements of these specifications, the Contractor shall furnish at no additional cost to the Government, other stone meeting the requirements of these specifications. Approval of stone from a source shall not be construed as a waiver of the right of the Government to require the Contractor to furnish stone which complies with these specifications. Materials produced from localized areas, zones or strata will be rejected when such materials do not comply with the specifications.

2.2 Quality Compliance. Test results and service records may be used to determine the acceptability of the stone protection materials. In the event compliance test reports and/or service records are not available, the material shall be subjected to the tests outlined in these specifications to determine its acceptability for use in the work. Before a proposed new source of stone will be considered for sampling and testing, one of the following criteria must be met:

a. A sufficiently developed quarry operation to demonstrate that an adequate quantity of stone is available to fulfill the contract requirements; or,

b. An exposed face plus sufficient explorations (results of which are made available to the Government) to demonstrate that an adequate quantity of stone is available to fulfill the contract requirements.

2.2.1 Bedding Material. Material shall contain no organic matter nor soft, friable particles, shall be clean, hard, and uncoated, and shall have a percentage of wear not to exceed 50 percent after 500 revolutions when tested in accordance with ASTM C131.

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

Test	Test Method	Requirement
Specific Gravity (Bulk SSD)	ASTM C 127	2.50 minimum
Absorption	ASTM C 127	2.0% maximum
Wetting & Drying	SPD Test Procedure(1)	No fracturing(3)
Sodium Sulfate	ASTM C 88(2)	10% max. loss(4)
Abrasion Loss	ASTM C 535	50% max. loss

In addition to the above tests, the stone shall be subjected to a petrographic and X-ray diffraction analysis. The stone must not contain any swelling type clay (illite or montmorillonite).

2.3.1 Test procedure wetting-and-drying tests. The initial step of the test is the careful examination of the entire sample and the selection of representative test specimens. The piece should be large enough to produce two cut slabs, 1 inch thick (+ 1/4 inch) with a minimum surface area of 30 square inches on one side. Two chunks approximately three by four inches are also chosen. The slabs and chunks are carefully examined under a low-power microscope and all visible surface features are noted and recorded. The specimens are then oven dried at 140 degrees F., for eight hours, cooled and weighed to the nearest tenth of a gram. The test specimens are photographed to show all surface features before the test. The chunks and slabs are then subjected to fifteen cycles of wetting and drying. One slab and one chunk are soaked in fresh tap water, the other slab and chunk are soaked in salt water prepared in accordance with ASTM D1141. 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 or rock surface, heaving of micaceous minerals, breakdown of matrix material and any other evidence of weakness development 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 flakes or particles which come off during the test are oven dried, weighed and photographed.

2.3.2 The test shall be made on 50 particles each weighing 100 grams, + 20 grams, in lieu of the gradation given in C 88.

2.3.3 Weakening and loss of individual surface particles is permissible unless bond of the surface grains softens and causes general disintegration of the surface material.

2.3.4 Sandstones which have a loss greater than the specified limit will be accepted if the Contractor demonstrates that the rock has a satisfactory service record.

2.4 Gradation Sampling and Testing for Stone Protection. Test shall be performed by an approved testing laboratory on samples selected by the Contracting Officer. The Government reserves the right to perform check tests and to use the Contractor's sampling and testing facilities to make the tests. Each sample shall consist of not less than five tons of materials and shall be selected at random from the production run. One gradation test is required at the beginning of production prior to delivery of stone to the project and a minimum of one additional test for each (10,000) tons of material placed. All sampling and gradation tests performed by the Contractor shall be under the supervision of the Contracting Officer.

## 2.5 Gradation.

2.5.1 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 requirements are met. All gradation tests shall be at the expense of the Contractor.

2.5.2 Bedding Material. Bedding material shall be well graded between the limits specified below when tested in accordance with ASTM C 136:

Sieve Size	Percent Finer (by Weight)
6 inches	100
3 inches	40 to 75
3/4 inches	20 to 40
Number 4	0 to 10

2.5.3 Type I stone may be processed from excavated materials at the site or obtained from any other source approved by the Contracting Officer and shall be reasonably well graded within the limits specified below:

Weight of Individual Pieces (Pounds)	Percent Smaller (by Weight)
500	100
250	50 - 75
130	30 - 50
20	0 - 10
15	0

2.5.4 Type II stone may be processed from excavated materials at the site or obtained from any other source approved by the Contracting Officer and shall be reasonably well-graded within the limits specified below:

Weight of Individual Pieces (Pounds)	Percent Smaller (by Weight)
200	100
100	50 to 75
50	35 to 50
10	0 to 10
7	0

2.5.6 Stone to be grouted may be obtained from required excavation or from any other source approved by the Contracting Officer. The 15-inch layer of grouted stone shall consist of reasonably well graded stone between 4 and 12 inches with not less than 40 nor more than 70 percent 6 inches in size. The 24-inch layer of grouted stone shall consist of reasonably well graded stone between 6 and 18 inches in size.

3. FOUNDATION PREPARATION. Areas on which bedding material or 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 one inch 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 bedding material or stone, the prepared base shall be inspected by the Contracting Officer and no material shall be placed thereon until that area has been approved.

#### 4. PLACEMENT.

4.1 Bedding Material shall be spread uniformly on the prepared base, in a satisfactory manner, to the neat lines indicated. Placing of material by methods which will tend to segregate particle sizes will not be permitted. Any damage to the prepared surface of the base during placing of the bedding material shall be repaired before proceeding with the work. Compaction of the bedding material will not be required but it shall be finished to present a reasonably even surface free from mounds or windrows. A tolerance of plus or minus one inch from the slope lines and grades when measured with a 10-foot straightedge will be allowed in each finished course, except that either extreme of such tolerance shall not be continuous over an area greater than 200 square feet.

4.2 Type I and II stone 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. Stone shall be placed to its full course thickness in one operation and in a manner to avoid displacing the underlying material. Method of placement shall be submitted to Contracting Officer 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 his expense to the lines and grades shown on the drawings. Self propelled equipment shall not be used on the levee slopes and/or toe 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 be permitted. A tolerance of 4 inches 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 200 square feet.

4.3 Stone to be grouted shall be placed to produce a surface in which the tops of the individual stones do not vary more than 1-1/2 inches from true grade. Double decking of thin flat stones to bring the surface up to the required grade will not be permitted.

5. 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 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.

6. WAYBILLS AND DELIVERY TICKETS. Copies of waybills or delivery tickets shall be submitted to the Contracting Officer during the progress of the work. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified waybills and/or certified delivery tickets for all stone actually used in the construction covered by the contract.

SECTION 2L

FENCING AND GUARDRAILS

Index

- |                            |  |
|----------------------------|--|
| 1. Applicable Publications | 5. Installation of Chain Link Fencing  |
| 2. Chain Link Fencing      | 6. Installation of Barbed Wire Fencing |
| 3. Barbed Wire Fences      |  |
| 4. Guardrail               |  |

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

1.1 Federal Specifications. (Fed. Spec.).

- |                |   |
|----------------|---|
| FF-T-276b      | Thimbles, Rope  |
| RR-C-271B      | Chains and Attachments, Welded and Weldless                                   |
| RR-F-191G/GEN. | Fencing, Wire and Post, Metal (and Gates, Chain-Link Fabric, and Accessories) |
| RR-W-410C      | Wire Rope and Strand  |

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

- |                  |  |
|------------------|--|
| A 121-77         | Zinc Coated (Galvanized) Steel Barbed Wire   |
| A 123-78         | Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip |
| A-585-71 (1975)  | Aluminum Coated Steel Barbed Wire  |
| A-641-71a (1975) | Zinc Coated (Galvanized) Carbon Steel Wire   |
| A-702-74         | Steel Fence Posts and Assemblies, Hot Rolled, for Field and Line-Type Fencing  |
| B-32-76          | Solder Metal   |
| C94-78a          | Ready-Mixed Concrete   |

1.3 West Coast Lumber Inspection Bureau (WCLB) publication.

- |        |   |
|--------|---|
| No. 16 | Standard Grading and Dressing Rules for Douglas Fir, Western Hemlock, |
|--------|---|

Western Red Cedar, White Fir, Sitka  
Spruce Lumber (Sep 1, 1970; Rev.  
Dec 1, 1976)

1.4 American Association of State Highway and Transportation Officials (AASHTO)  
Standard.

M 180-70

Corrugated Sheet Steel Beams for  
Highway Guardrail

1.5 American Wood Preservers' Association (AWPA) Standard:

C 14-79

Wood for Highway Construction  
Preservative Treatment by  
Pressure Processes

2. CHAIN LINK FENCING. Materials shall conform to Fed. Spec. RR-F-191G/GEN and  
other requirements specified below.

2.1 Chain-Link Fabric. Fed. Spec. RR-F-191, Part 1, type I, 2 ounce per square  
foot coating, or type II, 0.40 ounce per square foot coating, (Type V, dark green)  
and shall be 9 gage wire woven in a 2-inch mesh, (knuckled at both selvages).

2.2 Concrete. ASTM C 94, using 3/4-inch maximum size aggregate, and having  
minimum compressive strength of 3,000 psi at 28 days. Grout shall consist of one  
part Portland cement to 3 parts clean, well-graded sand and the minimum amount of  
water to produce a workable mix.

2.3 Post, Rails and Accessories for Chain-Link Fences. Fed. Spec. RR-F-191,  
zinc-coated, except as modified herein.

2.3.1 Gates. Gate fabric shall be attached to the gate frame by method standard  
with the manufacturer except that welding will not be permitted. Latches shall be  
arranged for padlocking so that padlock will be accessible from both sides of the  
gate regardless of the latching arrangement. All gate hinges shall be the non-  
removable bolt-pin type.

2.3.2 Reinforcing Wire. Minimum tensile strength of 80,000 pounds per square  
inch, zinc-coated for use with zinc-coated fabric (and aluminum-coated for use  
with aluminum-coated fabric. Minimum weight of aluminum coating shall be 0.40  
ounce of aluminum per square foot of wire).

2.3.3 Tie Wire. Aluminum alloy of 0.144-inch diameter for attaching fabric to  
top rail and to intermediate posts. Preformed clips of 6-gage zinc-coated steel  
wire may be used for attaching fabric to intermediate posts.

2.3.4 Hog Rings. Aluminum wire of 0.110-inch diameter for attaching fabric to  
top and bottom reinforcing wires.

2.3.5 Post Braces and Truss Rods. For each gate, corner, pull, or end post.  
Truss rods shall be provided with turnbuckles or other equivalent provisions for  
adjustment.

2.3.6 Post, Rails, and Braces. The posts, rails, and braces, except for bridge  
fence, shall be either round or H-Section; however, the same type shall be used  
throughout the project. For bridge fence, round members only shall be used.

3. BARBED WIRE FENCES. Materials for barbed wire, stays and posts shall conform to the requirements shown on the plans and as specified below.

3.1 Line posts and wire fasteners for attaching fence to posts shall conform to the requirements of ASTM A 702. The coating for the wire fasteners shall be Class 1. Line posts shall be painted green, but may have white tops.

3.2 End, corner and strain posts and braces shall conform to the requirements of ASTM A 702. Posts and braces shall be painted green.

3.3 Barbed steel wire may be either zinc coated or aluminum coated. Wire gauge shall be not less than 15 1/2 gauge. The minimum strand breaking strength shall be not less than 950 pound-force (4,230 Newtons).

3.4 Zinc coated wire shall conform to the requirements of ASTM A 121, except the zinc coating shall be 0.30 ounces of zinc per square foot.

3.5 Aluminum coated wire shall conform to the requirements of ASTM A 641, except that the minimum weight of zinc coating shall be 0.3 of an ounce per square foot.

3.6 Twisted wire stays shall conform to the requirements of ASTM A 641, except that the minimum weight of zinc coating shall be 0.3 of an ounce per square foot.

#### 4. GUARDRAIL

4.1 Douglas Fir shall be No. 1 grade, graded in accordance with the standard grading and dressing rules of the West Coast Lumber Inspection Bureau.

4.1.1 PRESERVATIVE TREATMENT. Lumber shall be preservative-treated after fabrication. Treatment shall be in accordance with AWWA C 14. Surfaces to be painted shall be treated with water-borne preservatives or pentachlorophenol in suitable solvents. After using a salt treatment, the moisture content of the lumber shall be reduced to not over 19 percent.

4.2 Metal Guardrail. Metal Beam Guard Railing. Except as otherwise specified rail elements, terminal sections, bolts, nuts, and other fittings shall conform to AASHTO M 180. The rail metal shall be open hearth, oxygen furnace, or electric furnace steel and, in addition to conforming to the requirements of AASHTO M 180, shall withstand a cold bend, without cracking, of 180 degrees around a mandrel of a diameter equal to 2-1/2 times the thickness of the plate. The rail elements may be hot-dip galvanized before fabrication, in which case the provisions in Section 3 of ASTM A 123 shall not apply. The weight of zinc coating, on rail elements, per square foot of actual surface shall average not less than 2.0 ounces and no individual specimen shall show less than 1.8 ounces. Workmanship shall be equivalent to good commercial practice and all edges, bolt holes and surfaces shall be free of torn metal, burrs, sharp edges and protrusions. Bolts shall have shoulders of such shape that will prevent the bolts from turning. Holes in rail elements shall be of similar shape as the bolt shoulder. Rail elements shall be spliced at intervals not to exceed 12 feet 6 inches and such splices shall be made at posts, unless otherwise shown.

4.2.2 Posts shall be treated Douglas fir 8 x 8 inches, 5 feet 4 inches long, and shall be rough or S4S. Only one type of post shall be used for any one continuous length of guardrail. Post shall be embedded 3 feet, in the ground and set in such position that the top of the guardrail shall be 1 inch below the top of the post. The space around the post shall be backfilled with approved earth material and

shall be thoroughly tamped. The surface of the backfill shall be crowned. Posts placed in paved areas shall have the pavement replaced in kind around the posts and crowned. Spacing of posts shall be at equal intervals in accordance with the manufacturers standards.

4.2.3 Blocks for metal beam guard railing shall be treated Douglas for 8" x 8 inches nominal size by one foot 2-inches, rough or S4S. The size tolerance of rough sawn blocks in the direction of the bolt holes shall be not more than plus or minus 1/4 inch. Only one type of block shall be used for any one continuous length of guard railing. Blocks shall be toenailed to posts with one 16 penny galvanized nail on each side of the block.

4.2.4 Rail shall be installed so that the top of the rail shall be one inch below the top of the post. Ends of all rails shall be turned away from the roadway and shall be fitted with manufacturer's standard terminal sections. Joint design shall be in accordance with the manufacturer's standards. The rail at joints shall have full bearing. Rail element joints shall be lapped not less than 12-1/2 inches in the direction of traffic and bolted. The bolted connection of the rail element to the post shall withstand a 5,000-pound pull at right angles to the line of the railing.

## 5. INSTALLATION OF CHAIN LINK FENCING.

5.1 General. The fence shall be installed to the alinement indicated. Fence installation shall be in accordance with the fence manufacturer's written installation instructions except as modified herein.

5.2 Excavation for concrete-embedded items shall be of the dimensions indicated except in bedrock. If bedrock is encountered before reaching the required depth, the excavation shall be continued to the depth indicated or 18 inches into the bedrock, whichever is less, and shall be a minimum of 2 inches larger than the outside diameter of the post. Post hole shall be cleared of loose material. Waste material shall be spread where directed.

5.3 Post Setting. Posts shall be set plumb and in alinement. Posts shall be set in concrete bases of dimensions indicated except where posts are set in preformed holes or in holes excavated in bedrock. Concrete shall be thoroughly compacted so as to be free of voids and finished in a dome. Braced pull posts shall be installed at fence ends, intersections, each change in direction of 10 degrees or more horizontally, and at each grade change of 5 degrees or more. In addition, straight runs between braced pull posts shall not exceed 500 feet. In bedrock and in preformed holes, posts shall be set with a minimum of 1 inch of grout around each post. Grout shall be thoroughly worked into the hole so as to be free of voids and finished in a dome. Concrete and grout shall be cured a minimum of 72 hours before any further work is done on the posts.

5.4 Post Caps and Supporting Arms shall be installed as recommended by the manufacturer. Post caps and barbed-wire supporting arms shall be of the design as required to accommodate the top rail. In addition to manufacturer's standard connections, supporting arms shall be securely anchored to posts in such manner that will prevent easy removal with hand tools. Studs driven by low-velocity explosive-actuated tool may be used with steel, wrought iron, ductile iron, or malleable iron. Studs driven by any explosive-actuated tool will not be used with gray iron or other material that will be fractured.

5.5 Top Rails. Top rail shall be installed before installing chain-link fabric and shall pass through intermediate post caps. The top rail shall have expansion couplings spaced as indicated. Top rail shall be installed at bridge approaches and where the slope of the wall is greater than 2:1.

5.6 Top and Bottom Reinforcing Wires shall be installed before installing chain-link fabric and shall be pulled taut.

5.7 Fabric shall be pulled taut and secured to the top wire and bottom wire close to both sides of each post and at intervals of not more than 24 inches on centers. Fabric shall be attached to the sides of the post away from the channel or enclosed opening. Fabric shall be secured to braced pull posts using stretcher bars and ties or clips or by integrally weaving to integral fastening loops of ends, corner, pull, and gate posts for the full length of each post. Fabric shall be attached to line posts at not greater than 15 inches on center using ties or clips. Splices in fabric shall be made with suitable splicing wire. Edges of fabric made by field tests shall be knuckled or barbed as applicable.

5.8 Gates shall be installed as indicated. Hinge brackets shall be installed in drilled holes in the gate and gate posts.

5.9 Repair. In the event that any portion of galvanized items 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.

5.10 The chain-link fabric shall be stretched across the top of the channel over the side drain. No chain-link fabric shall extend down into the side drain channel.

5.11 Additional bottom reinforcing wires shall extend along the fence and down into the side drain channel. The additional wires shall start at the post at the intersection of the channel wall and side drain, extend down into the side drain channel at 9 inch spacings and end at the post at the other intersection of the channel wall and side drain. The wire shall be 9 gage galvanized steel wire and be tied to the posts by placing them through a 1/4 inch hole drilled through the posts.

## 6. INSTALLATION OF BARBED WIRE FENCING

6.1 In general, in determining the post spacing, measurement will be made parallel to the slope of the natural ground, and all posts shall be placed in a vertical position, except in unusual locations where it would be more satisfactory to place the posts generally perpendicular to the slope of the ground.

6.2 At the locations where two fences intersect or at the point when a fence line is changed in direction by 15 degrees or more, such locations shall be considered as corners and corner posts shall be installed.

6.3 All posts and braces shown on the plans to be set in concrete footings shall be set in such a manner that they will remain in reasonably close conformity to the location, line and grade established or required, after the concrete has hardened. No wire shall be attached to posts set in concrete or posts with braces set in concrete until the concrete until the concrete has cured sufficiently.

6.4 Steel posts shall be driven to the depth and spacing shown on the plans. The wire shall be stretched out and fastened securely to each post. The placing of braces, guy wires, sag weights and other details shall be as shown on the plans.

\* \* \* \* \*

SECTION 3A

FORMWORK FOR CONCRETE

PART 1 - GENERAL

Index

- |                        |                          |
|------------------------|--------------------------|
| 1. Reference Standards | 5. Installation          |
| 2. Submittals          | 6. Chamfering            |
| 3. Design              | 7. Coating               |
| 4. Materials           | 8. Removal               |
|                        | 9. Field Quality Control |

1. REFERENCE STANDARDS/

1.1 American Concrete Institute (ACI) Standards.

ACI 347-78

Recommended Practice for Concrete  
Formwork

1.2 American Society for Testing and Materials (ASTM) with Corresponding CRD  
Standard Indicated where Available.

A 446-76

Steel Sheet, Fine-Coated (Galvanized  
by Hot Dip Process, Physical  
(Structural) Quality

C 31-69 (R 1975)

Making and Curing Concrete Test  
Specimens in the Field.

C 39-72 (R 1979)

Compressive Strength of Cylindrical  
Concrete Specimens.

1.3 U.S. Department of Commerce, National Bureau of Standards (NBS) Product  
Standard.

PS 1-74

For Construction and Industrial  
Plywood

2. SUBMITTALS.

2.1 Shop Drawings. Drawings and computations for all formwork required shall be submitted at least 14 days before either fabrication on site or before delivery of prefabricated forms. The drawings and data submitted include the type, size, quantity and strength of all materials of which the forms are made, the plan for jointing of facing panels, details affecting the appearance, and the assumed design values and loading conditions.

2.2 Manufacturers Literature shall be submitted for plywood, concrete form hard board, form accessories, prefabricated forms, form coating and form lining materials.

## PARTS 2 - PRODUCTS

3. DESIGN. 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 Chapter 1 of ACI Standard 347. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall have sufficient rigidity to maintain specified tolerances.

### 4. MATERIALS.

4.1 Forms shall be fabricated with facing materials that produce the specified construction tolerance requirements and the surface requirements of Section: CAST-IN-PLACE STRUCTURAL CONCRETE.

4.1.2 Class "B: Finish. This class of finish shall apply to all surfaces that will be permanently exposed to view. The sheathing shall be composed of tongue-and-groove or shiplap lumber, plywood conforming to NBS Product Standards PS-1 exterior type, grade B-B plyform, tempered concrete form hardboard, or steel. Steel lining on wood sheathing will not be permitted.

4.1.3 Class "D" Finish. This class of finish shall apply to all surfaces upon which concrete or earth will be placed. The sheathing may be of wood or steel.

4.2 Form Accessories. Ties and other similar form accessories to be partially or wholly embedded in the concrete shall be of commercially manufactured type. After the ends or end fasteners have been removed, the embedded portion of metal ties shall terminate not less than 2-inches from any concrete surface either exposed to view or exposed to water. Plastic snap ties may be used in locations where the surface will not be exposed to view. Form ties shall be constructed so that the ends or end fasteners can be removed without spalling the concrete.

4.3 Form Coating shall be a commercial formulation of satisfactory and proven performance that will not bond with, stain or adversely affect concrete surfaces and will not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds.

## PART 3 - EXECUTION

5. INSTALLATION. Forms shall be mortar tight, properly aligned and adequately supported to produce concrete surfaces meeting the surface requirements construction tolerances of Section: CAST-IN-PLACE STRUCTURAL CONCRETE. Where concrete surfaces are to be permanently exposed to view, joints in form panels shall be arranged to provide a pleasing appearance. Where forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface so as to obtain accurate alinement of the surface and to prevent leakage of mortar. Forms shall not be re-used if there is any evidence of surface wear and tear or defects which would impair the quality of the surface. All surfaces of forms and embedded materials shall be cleaned of any mortar from previous concreting and of all other foreign material before concrete is placed in them.

6. CHAMFERING. All exposed joints, edges and external corners shall be chamfered by molding placed in the forms unless the drawings specifically state the chamfering is to be omitted or as otherwise specified. Chamfered joints shall not

be permitted where earth or rockfill is placed in contact with concrete surfaces. Chamfered joints shall be terminated a sufficient distance outside the limit of the earth or rockfill so that the end of the joints will be clearly visible.

7. COATING. Forms for exposed or painted surfaces shall be coated with form oil or a form-release agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's printed or written instructions. Forms for unexposed surface may be wet with water in lieu of coating immediately before placing concrete, except that in cold weather with probable freezing temperatures coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

8. REMOVAL. Forms shall not be removed without approval and all removal shall be accomplished in a manner which will prevent injury to the concrete. Forms shall not be removed before the expiration of the minimum time indicated below, except as otherwise directed or specifically authorized. When conditions of the work are such as to justify the requirement, forms will be required to remain in place for a longer period.

8.1 Unsupported Concrete. Formwork for walls, columns, sides of beams, gravity structures and other vertical type forms not supporting the weight of concrete shall not be removed in less than 24 hours. The time depends on temperature, lift heights and type and amount of cementitious material in the concrete. Where forms for column, walls and sides of beams also support formwork for slabs or beam soffits, the removal time of the latter shall govern.

9. FIELD QUALITY CONTROL. Forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing.

\* \* \* \* \*

SECTION 3B  
CONCRETE REINFORCEMENT

Index

- |                                     |                 |
|-------------------------------------|-----------------|
| 1. Applicable Publications          | 5. Submittals   |
| 2. Scope                            | 6. Materials    |
| 3. Related Work Specified Elsewhere | 7. Installation |
| 4. Quality Assurance                |                 |

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

1.1 American Concrete Institute (ACI) Standards.

ACI 315-74 (R-1978)	Manual of Standard Practice for Detailing Reinforced Concrete Structures
---------------------	--

ACI 318-77	Building Code Requirements for Reinforced Concrete
------------	---

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

A 185-79	Welded Steel Wire Fabric for Concrete Reinforcement
----------	--

A 497-79	Welded Deformed Steel Wire Fabric for Concrete Reinforcement
----------	---

A 615-79	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
----------	--

E 8-79a	Tension Testing of Metallic Materials
---------	---------------------------------------

1.3 American Welding Society (AWS) Code.

D 12.1-79	Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Structures
-----------	---

2. SCOPE. The work covered by this section consists of furnishing all equipment, materials, techniques and labor for providing and placing steel bars, welded wire fabric and accessories for concrete reinforcement.

3. RELATED WORK SPECIFIED ELSEWHERE.

3.1 Formwork. Section 3A FORMWORK FOR CONCRETE.

3.2 Joints. Section 3C, EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS IN CONCRETE.

3.3 Concrete. Section 3D CAST-IN-PLACE STRUCTURAL CONCRETE.

#### 4. QUALITY ASSURANCE.

4.1 Materials Tests. The Contractor shall have required material tests performed by an approved laboratory to demonstrate that the materials are in conformance with the specifications. Tension tests shall be performed on full cross section specimens in accordance with ASTM E 8, using a gage length that spans the extremities of specimens with welds or sleeves included. Tests shall be at the Contractor's expense.

#### 5. SUBMITTALS.

5.1 Shop Drawings. The Contractor shall prepare and submit complete shop drawings to the Contracting Officer for approval in accordance with specified requirements. Shop drawings shall include the following.

5.1.1 Reinforcement steel schedules complete with the quantity, shape and size, dimensions, weight per foot and total weights, and bending details.

5.1.2 Details of bar supports including types, sizes, spacing and sequence.

5.2 Test Reports. Certified tests reports of reinforcement steel showing that the steel comply with the applicable specifications shall be submitted to the Contracting Officer by the Contractor. Reports shall be furnished for each steel shipment and shall be identified with specific lots prior to use of the steel in the work.

#### 6. MATERIALS

##### 6.1 Steel Bars.

6.1.1 Billet-Steel Bars shall conform to ASTM A 615, Grade 40 with the following exceptions.

6.1.2 If Grade 40 bars are unavailable, the Contractor may substitute Grade 60 bars of the same size and spacing as indicated for Grade 40 bars when authorized by the Contracting Officer.

6.1.3 Tension test specimens shall be bars of full cross section as rolled for all sizes.

6.1.4 The bend test requirements shall be based upon 180 degree bends of full size bars for all grades of steel. The bend diameters for bend tests shall be as indicated in the following table and shall be measured on the inside of bars.

<u>Bar Size</u>	<u>Maximum Diameter</u>
#3, 4 and 5	3-1/2 bar diameters
#6, 7 and 8	5 bar diameters
#9, 10 and 11 (Grade 40)	5 bar diameters
#9, 10 and 11 (Grade 60)	7 bar diameters

The Contractor shall furnish results of all tension and bend tests performed.

6.2 Welded Wire Fabric shall conform to ASTM A 185, gages, spacing and arrangement of wires as indicated on the drawings or ASTM A 497, sizes, spacing, deformations and dimensions as indicated on the drawings.

### 6.3 Accessories.

6.3.1 Bar Supports shall conform to ACI 315. Bar supports for formed surfaces exposed to view or to be painted shall be plastic protected wire, stainless steel or precast concrete supports. Precast concrete bar supports shall be wedge-shaped, not larger than 3-1/2 x 3-1/2 inches, of thickness equal to that indicated for concrete cover and shall have an embedded hooked tie wire for anchorage. If formed surface is exposed to view, the precast concrete bar support shall be the same quality, texture and color as the finish surface.

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

7. INSTALLATION. Reinforcement steel and accessories shall be installed or placed as specified and as shown on contract and approved shop drawings. Placement details of reinforcement and accessories not specified or shown on the drawings shall be in accordance with ACI 315 or ACI 318. Reinforcement shall be fabricated to shapes and dimensions shown, placed where indicated within specified tolerances and adequately supported during concrete placement. At the time of concrete placement all reinforcement shall be free from loose, flaky rust, scale (except tight mill scale), mud, oil, grease or any other coating that might reduce the bond with the concrete.

7.1 Hooks and Bends. Reinforcement bars may be mill or field bent. All bars shall be bent cold unless otherwise authorized. No bars partially embedded in concrete shall be field bent unless indicated on the drawings or otherwise authorized. All hooks or bends shall be in accordance with ACI 318.

7.2 Welding of reinforcement bars will be permitted only where indicated on the drawings or as otherwise directed by the Contracting Officer. Welding shall be performed in accordance with AWS D 12.1, except where otherwise specified or indicated on the drawings.

### 7.3 Placing Tolerances.

7.3.1 Spacing of Bars. Bars shall be spaced as indicated on the drawings or as otherwise directed. The spacing between adjacent bars and the distance between layers may not vary from the indicated position by more than bar diameter nor more than one inch.

7.3.2 Concrete Cover. The minimum concrete cover of main reinforcement steel shall be as indicated on the drawings. The tolerances shall be as follows.

<u>MINIMUM COVER</u>	<u>VARIATION</u>
6"	+ 1/2"
4"	+ 3/8"
3"	+ 3/8"
2"	+ 1/4"
1-1/2"	+ 1/4"
1"	+ 1/8"
3/4"	+ 1/8"

7.4 Splicing. Splices in reinforcement steel shall be as specified, shown on the drawings or as directed by the Contracting Officer. Bars may be spliced at alternate or additional locations at no additional cost to the Government, subject to the approval of the Contracting Officer. Except as provided herein, all

splicing shall be in accordance with approved splicing procedures and the requirements of ACI 318.

7.4.1 Lapped Splices shall be used only for bars smaller than size #14. Bar laps may be placed in contact and securely tied or may be spaced transversely apart to permit the embedment of the entire surface of each bar in concrete, but shall not be spaced farther apart than one-fifth the required length of lap nor 6-inches. Lengths of laps for bars or welded wire fabric shall conform to the requirements of ACI 318, except when otherwise shown on the drawings.

\* \* \* \* \*

## SECTION 3C

### EXPANSION, CONTRACTION AND CONSTRUCTION JOINTS IN CONCRETE

#### Index

- |                                     |                 |
|-------------------------------------|-----------------|
| 1. Scope                            | 5. Submittals   |
| 2. Related Work Specified Elsewhere | 6. Materials    |
| 3. Applicable Publications          | 7. Installation |
| 4. Quality Assurance                |                 |

1. SCOPE. This section covers the materials, techniques and workmanship requirements for forming expansion, contraction and construction joints in concrete structures.

2. RELATED WORK SPECIFIED ELSEWHERE. Major requirements for concrete work are specified in Section 3D, CAST-IN-PLACE STRUCTURAL CONCRETE.

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

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

D 1751-73 (R 1978)  
(CRD-C 508)

Preformed Expansion Joint Fillers  
for Concrete Paving and Structural  
Construction (Non-extruding and  
Resilient Bituminous Types)

D 1752-67 (R 1978)  
(CRD-C 509)

Preformed Sponge Rubber and Cork  
Expansion Joint Fillers and Concrete  
Paving and Structural Construction

3.2 Federal Specifications (Fed. Spec.).

TT-S-227E  
(CRD-C 506)

Sealing Compound, Elastomeric Type,  
Multi-Component (for Caulking,  
Sealing, and Glazing in Buildings  
and Other Structures)

4. QUALITY ASSURANCE.

4.1 Materials Tests

4.1.1 Field-Molded Sealants. Samples of sealant and primer, when use of primer is recommended by the manufacturer, as required in 5.2.1 below shall be tested by and at the expense of the Government for compliance with Fed. Spec. TT-S-227. If the sample fails to meet specification requirements, new samples shall be provided and the cost of retesting will be deducted from payments due to the Contractor.

5. SUBMITTALS.

5.1 Test Reports. Certified manufacturer's test reports shall be provided for premolded expansion-joint filler strips, and lubricant to verify compliance with the applicable specification.

## 5.2 Samples.

5.2.1 Field-Molded Sealant and Primer. One gallon of field-molded sealant and one quart of primer (when use of primer is recommended by the sealant manufacturer) shall be provided for testing.

## 6. MATERIALS.

6.1 Expansion Joint Filler Strips, Premolded shall conform ASTM D 1751 or ASTM D 1752, Type I or resin impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

## 6.2 Joint Sealants and Seals.

6.2.1 Field Molded Sealants shall conform to Fed. Spec. TT-S-227, Type II for vertical joints and Type I for horizontal joints, Class A. Bond breaker material shall be polyethylene tape, coated paper, metal foil or similar type materials. The back-up material shall be compressible, nonshrink, nonreactive with sealant, and nonabsorptive material type such as extruded butyl or polychloroprene foam rubber.

7. INSTALLATION. Joint locations and details, including materials and methods of installation of joint fillers and waterstops, shall be as specified, shown on the drawings and as directed. In no case shall any fixed metal be continuous through an expansion or contraction joint.

7.1 Expansion Joints. Premolded filler strips shall have oiled wood strips secured to the top thereof and shall be accurately positioned and secured against displacement to clean, smooth concrete surfaces. The wood strips shall be slightly tapered, dressed and of the size required to install filler strips at the desired level below the finished concrete surface and to form the groove for the joint sealant or seals to the size shown on the drawings. Material used to secure premolded fillers and wood strips to concrete shall not harm the concrete and shall be compatible with the joint sealant or seals. The wood strips shall not be removed until after the concrete curing period. The groove shall be thoroughly cleaned of all laitence, curing compound, foreign materials, protrusions of hardened concrete and any dust which shall be blown out of the groove with oil-free compressed air.

7.1.1 Joints With Field-Molded Sealant. Joints shall not be sealed when the sealant, air or concrete temperature is less than 40°F. Bond breaker and back-up material shall be installed where required. Joints shall be primed and filled flush with joint sealant in accordance with the manufacturer's recommendations.

\* \* \* \* \*

SECTION 3D

CAST-IN-PLACE STRUCTURAL CONCRETE

PART I - GENERAL

Index

- |                                     |  |
|-------------------------------------|--|
| 1. Related Work Specified Elsewhere | 11. Placing                                      |
| 2. Reference Standards              | 12. Repair of Surface Defects                    |
| 3. Quality Assurance                | 13. Finishing Unformed Surfaces                  |
| 4. Evaluation and Acceptance        | 14. Curing and Protection                        |
| 5. Submittals                       | 15. Finishing Formed Surfaces                    |
| 6. Materials                        | 16. Setting of Base Plates and<br>Bearing Plates |
| 7. Proportioning                    | 17. Contractor Quality Control                   |
| 8. Production of Concrete           |  |
| 9. Preparation                      |  |
| 10. Conveying                       |  |

1. RELATED WORK SPECIFIED ELSEWHERE.

1.1 Expansion, Contraction and Construction Joints in Concrete Section 3C

1.2 Concrete Reinforcement - Section 3B

1.3 Formwork for Concrete - Section 3A

2. REFERENCE STANDARDS.

2.1 American Concrete Institute (ACI) Standards.

ACI 211.1-77  
(CRD-C99)

Recommended Practice for Selecting  
for Normal Weight and Heavyweight  
Concrete

ACI 214-77

Recommended Practice for Evaluation  
of Compression Test Results of  
Field Concrete

ACI 305

Hot Weather Concreting - Committee  
Report, 1977 - Title No. 74-33

ACI 309-72

Recommended Practice for Consolidation  
Concrete

2.2 American Society for Testing and Materials (ASTM) with Corresponding CRD  
Standard Indicated Where Available.

C 31-69 (1975)  
(CRD-C 11)

Making and Curing Concrete Test  
Specimens in the Field

C 33-80 (CRD-C 133)

Concrete Aggregates

C 33-72 (R 1979)  
(CRD-C 14)

Compressive Strength of Cylindrical  
Concrete Specimens

C 70-79 (CRD-C 111)	Surface Moisture of Fine Aggregate
C 94-80 (CRD-C 31)	Ready-Mixed Concrete
C 125-79a (CRD-C 43)	Terms Relating to Concrete and Concrete Aggregates
C 136-76 (CRD-C 103)	Sieve or Screen Analysis of Fine and Coarse Aggregates
C 143-78 (CRD-C 5)	Slump of Portland Cement Concrete
C 171-69 (R 1975) (CRD-C 310)	Sheet Materials for Curing Concrete
C 172-71 (R 1977) (CRD-C 4)	Sampling Fresh Concrete
C 192-76 (CRD-C 10)	Making and Curing Concrete Test Specimens in the Laboratory
C 231-78 (CRD-C 41)	Air Content of Freshly Mixed Concrete by the Pressure Method
C 494-79 (CRD-C 87)	Chemical Admixtures for Concrete
C 566-78 (CRD-C 113)	Total Moisture Content of Aggregate by Drying
D 75-71 (R 1978) (CRD-C 155)	Sampling Aggregates
D 98-77a (CRD-C 505)	Calcium Chloride
E 329-77 (CRD-C 500)	Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction

2.3 Concrete Plant Manufacturer's Bureau (CPMB).

6th Edition (CRD-C 95)	Concrete Plant Standards
------------------------	--------------------------

2.4 Federal Specifications (Fed. Specs.) with Corresponding CRD Standards.

SS-C-1960/3 (CRD-C 200)	Cement, Portland
SS-C-1960/4 (CRD-C 200)	Cement, Hydraulic, Blended
SS-C-1960/5 (CRD-C 200)	Pozzolan, for Use in Portland Cement Concrete

2.5 National Bureau of Standards (NBS) Handbook.

44 Specifications, Tolerance and Other Technical Requirements for Commercial Weighing and Measuring Devices (4th Editions 1971 with Replacement Sheets)

2.6 U.S. Army Corps of Engineers Handbook for Cement and Concrete (CRD).

CRD-C 13-66	Air Entraining Admixture for Concrete
CRD-C 55-78	Concrete Mixer Performance
CRD-C 100-75	Concrete Aggregate and Aggregate Sources and Selection of Material for Testing
CRD-C 112-69	Surface Moisture in Aggregate by Water Displacement
CRD-C 143-62	Meters for Automatic Indication of Moisture in Fine Aggregate
CRD-C 300-77	Membrane-Forming Compounds for Curing Concrete
CRD-C 400-63	Water for Use in Mixing or Curing Concrete

3. QUALITY ASSURANCE

3.1 Construction Testing by Government. The Government will sample and test aggregates and concrete to determine compliance with the specifications. The Contractor shall provide facilities and labor as may be necessary for procurement of representative test samples. When the Contractor proposes to reduce concrete mixing time, uniformity tests at reduced mixing time will be made by the Government at the Contractor's expense. Samples of aggregates will be obtained at the point of batching. Concrete will be sampled in accordance with ASTM C 172. Slump and air content will be determined in accordance with ASTM C 143 and ASTM C 231, respectively. Compression test specimens will be made and cured in accordance with ASTM C 31 and compression test specimens tested in accordance with ASTM C 39. Samples for strength tests of each class of concrete placed each day will be taken not less than once each day, nor less than once for each 150 cu. yd. of concrete, nor less than once for each 5,000 sq. ft. of surface area of one side of slabs or walls. Three specimens will be made from each sample, two will be tested at 28 days for acceptance and one will be tested at 7 days for information. The acceptance test results will be the average of the strengths of the two specimens tested at 28 days.

4. EVALUATION AND ACCEPTANCE.

4.1 Concrete. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equal or exceed the required specified strength  $f_c$  and no individual test result falls below the specified strength  $f_c$  by more than 500 pounds per square inch. Structural analysis or additional testing may be required at the Contractor's expense when the strength of the concrete in the structure is considered potentially deficient.

Concrete work judged inadequate by structural analysis or by results of tests shall be reinforced with additional construction as directed by the Contracting Officer or shall be replaced at the Contractor's expense.

4.2 Construction Tolerances. Variation in alinement, grade and dimensions of the structures from the established alinement, grade and dimensions shown on the drawings shall be within the tolerances specified in the following table.

TABLE I

TOLERANCES FOR BRIDGES, EROSION PROTECTION  
STRUCTURES AND SMALL HYDRAULIC STRUCTURES

(1) Departure from established alinement	1-inch
(2) Departure from established grades	1-inch
(3) Variation from the plumb or the specified batter in the lines and surfaces of columns, piers, walls, and in arrises	Exposed, in 10 feet 1/2-inch Backfilled, in 10 feet 1-inch
(4) Variation from the level or from the grades indicated on the drawings in slabs, beams, horizontal grooves, and railing offsets	Exposed, in 10 feet 1/2-inch Backfilled, in 10 feet 1-inch
(5) Variation in cross-sectional dimensions of columns, piers slabs, walls, beams, and similar parts	Minus 1/4-inch Plus 1/2-inch
(6) Footings:	
a. Variation of dimensions in plan	Minus 1/2-inch Plus 2-inches when formed or plus 3-inches when placed against unformed excavation.
b. Misplacement of eccentricity	2 percent of the footings width in the direction of misplacement but not more than 2-inches
c. Reduction in thickness	Minus 5 percent of specified thickness
(7) Variation in the sizes and locations of slab and wall openings	1/2-inch

4.3 Surface Requirements. The surface requirements for the classes of finish required by Section. FORMWORK FOR CONCRETE shall be as hereinafter specified. Allowable irregularities are designated "abrupt" or "gradual" for purposes of

providing for surface variations. Offsets resulting from displaced, misplaced or mismatched forms, or sheathing, or by loose knots in sheathing, or other similar form defects, shall be considered "abrupt" irregularities. Irregularities resulting from warping, unplaneness or similar uniform variations from planeness, or true curvature, shall be considered "gradual" irregularities. "Gradual" irregularities will be checked for compliance with the prescribed limits with a 5-ft template, consisting of a straightedge for plane surfaces and a shaped template for curved or warped surfaces. In measuring irregularities, the straightedge or template may be placed anywhere on the surface in any direction, with the testing edge held parallel to the intended surface.

Class of Finish

Irregularities

Abrupt, Inches

Gradual, inches

+ Variation for Class C finish shall not exceed zero positive and 1/8-inch negative in the direction of flow of the water.

4.4 Appearance. Surfaces which are permanently exposed shall be cleaned if stained or otherwise discolored, by a method which does not harm the concrete and which is approved by the Contracting Officer.

5. SUBMITTALS.

5.1 Test Reports.

5.1.1 Concrete mixture proportions shall be submitted for approval. The proportions of all ingredients and nominal maximum coarse aggregate size that will be used in the manufacture of each quality of concrete shall be stated. Proportions shall indicate weight of cement and water and weights of aggregates in a saturated surface-dry condition. The submission shall be accompanied by test reports from a laboratory complying with ASTM E 329 attesting that proportions thus selected will produce concrete of the qualities indicated. No substitution shall be made in the source or type of materials used in the work without additional tests to show the new materials and quality of concrete are satisfactory.

5.1.2 Cement will be accepted on the basis of manufacturer's certification of compliance, accompanied by mill test reports that materials meet requirements of the specification under which it is furnished. Certification and mill test reports shall identify the particular lot furnished. No cement shall be used until notice of acceptance has been given by the Contracting Officer. Cement will be subject to check testing from samples obtained at the mill, at transfer points or at the project site, as scheduled by the Contracting Officer, and such sampling will be by or under the supervision of the Government at its expense. Material not meeting specification shall be promptly removed from the site of work.

5.2 Manufacturers' Certificate.

5.2.1 Accelerating admixture shall be certified for compliance with all specification requirements.

5.2.2 Impervious sheet curing materials shall be certified for compliance with all specification requirements.

5.2.3 Air-entraining admixture shall be certified for compliance with all specification requirements.

5.2.4 Water-reducing admixture shall be certified for compliance with all specification requirements.

5.2.5 Curing compound shall be certified for compliance with all specification requirements.

5.3 Review of Plant, Equipment and Methods.

5.3.1 Batch of Plant, Equipment and Methods.

5.3.1 Batch Plant. Details of the data on concrete plant shall be submitted for review by the Contracting Officer for conformance with paragraph: PRODUCTION OF CONCRETE.

5.3.2 Mixers. The make, type and capacity of concrete mixers proposed for mixing concrete shall be submitted for review by the Contracting Officer for conformance with paragraph: PRODUCTION OF CONCRETE.

5.3.3 Conveying Equipment. The methods and equipment for transporting, handling, and despositing the concrete shall be submitted for review by the Contracting Officer for conformance with paragraph: CONVEYING.

5.3.4 Placing. All placing equipment and methods shall be submitted for review by the Contracting Officer for conformance with paragraph: PLACING.

5.3.5 Joint Clean-up. The method and equipment proposed for joint clean-up shall be submitted for review by the Contracting Officer for conformance with paragraph: PREPARATION FOR PLACING. Method of waste disposal for any method proposed for joint clean-up shall be approved by the Contracting Officer.

5.3.6 Curing. The curing medium and methods to be used shall be submitted for review by the Contracting Officer for conformance with paragraph: CURING AND PROTECTION.

5.3.7 Cold-Weather Requirements. If concrete is proposed to be placed under cold weather conditions the materials, methods and protection proposed to accomplish it in accordance with the requirements of paragraph: PLACING, CURING AND PROTECTION shall be approved by the Contracting Officer.

5.3.8 Hot-weather Requirements. If concrete is proposed to be placed under hot weather conditions the materials and methods proposed to accomplish it in accordance with the requirements of paragraph: PLACING, CURING AND PROTECTION shall be approved by the Contracting Officer.

## PART II - PRODUCTS

### 6. MATERIALS

6.1. Cement shall be Portland cement and shall conform to appropriate specifications listed below.

6.1.1 Portland Cement. Portland cement shall conform to Fed. Spec. SS-C-1960/3, Type II.

6.1.2 High-Early-Strength Portland Cement. High Early strength Portland cement shall conform to Fed. Spe. SS-C-1960/3, Type III used only when specifically approved in writing.

6.2 Aggregates shall be produced from approved sources. Fine aggregates will conform to the grading requirements of ASTM C-33 and coarse aggregates will conform to the grading requirements of ASTM C-33 sizes 1-1/2 or 3/4. The nominal maximum size shall be as listed in paragraph: PROPORTIONING.

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

6.3.1 Air-entraining admixture. CRD-C 13.

6.3.2 Accelerating admixture. Calcium chloride conforming to ASTM D 98.

6.3.3 Water-reducing or retarding admixtures ASTM C 494, Type A, B or D.

6.4 Curing Materials.

6.4.1 Impervious sheet materials ASTM C 171, type optional except polyethylene film, if used, shall be white opaque.

6.4.2 Membrane-forming curing compound CRD-C 300, pigmented, nonpigmented, or chlorinated rubber base as required in paragraph: CURING AND PROTECTION. Non-pigmented compound shall contain a fugitive dye.

6.5 Water for mixing shall be fresh, clean and drinkable, except that undrinkable water may be used if it meets the requirements of CRD-C 400. Water for curing shall not contain any substance that is injurious to the concrete.

7. PROPORTIONING.

7.1 Quality and Location. Concrete of various qualities indicated and as required under other sections shall be proportioned for use in various structures or portions of structures as follows:

7.1.1 Strength. Specified compressive strength  $f_c$  shall be 3000 psi each 28 days, unless otherwise indicated.

7.1.2 Maximum Water - Cement Ratio. Maximum water cement ratio shall be 0.50 for invert slab and 0.55 for other structures.

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

7.3 Air Content as determined by ASTM C 231 shall be  $5.0 \pm 1.5$  percent except that when the nominal maximum size coarse aggregate is 3/4-inch it shall be  $6.0 \pm 1.5$  percent.

7.4 Slump. The slump shall be determined in accordance with ASTM C-143 and shall not depart more than 1-1/2 inches from that stipulated below:

Structural ElementSlump; inches

Massive or lightly reinforced  
section, tunnel inverts, bridge  
decks and all slabs

1-1/2

7.5 Concrete Proportioning. Trial design batches and testing requirements for various qualities of concrete specified shall be the responsibility of the Contractor. Samples of approved aggregates shall be obtained in accordance with the requirements of ASTM D 75. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by manufacturer's test reports indicating compliance with applicable specified requirements. Trial mixtures having proportions, consistencies and air content suitable for the work shall be made based on ACI Standard 211.1, using at least three different water-cement ratio which will produce a range of strength encompassing those required for the work. Trial mixtures shall be designed for maximum permitted slump and air content. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192. They shall be tested at 7 and 28 days in accordance with ASTM C 39. From these test results a curve shall be plotted showing the relationship between water-cement ratio and strength.

7.6 Average Strength. For each portion of the structure, proportions shall be selected so that the maximum permitted water-cement ratio is not exceeded and so as to produce an average strength  $f_{cr}$  exceeding the specified strength  $f'_c$  by the amount indicated below. Where the production facility has a standard deviation record determined in accordance with ACI 214, based on 30 consecutive strength tests of similar mixture proportions as proposed, obtained within one year of the time when concrete placing is expected, it shall be used in selecting average strength. The average strength used as the basis for selecting proportions shall exceed the specified strength  $f'_c$  by at least

- 350 psi if standard deviation is less than 300 psi
- 550 psi if standard deviation is 300 to 450 psi
- 750 psi if standard deviation is 450 to 600 psi
- 900 psi if standard deviation is 600 to 750 psi

If the standard deviation exceeds 750 psi or if a standard deviation record is not available, proportions shall be selected to produce an average strength at least 1,000 psi greater than the specified strength.

### PART III - EXECUTION

#### 8. PRODUCTION OF CONCRETE.

8.1 Capacity. The batching and mixing equipment shall have a capacity of at least 100 cubic yards per hour.

8.2 Batching Plant shall conform to the requirements of the Concrete Plant Standards of CPMB and as specified; however, rating plates attached to batch plant equipment are not required.

8.2.1 Equipment. The batching controls shall be semi-automatic or automatic. The semi-automatic or automatic batching system shall be equipped with an accurate recorder or recorders which meet the requirement of the Concrete Plant Standards

of CPMB. Separate bins or compartments shall be provided for each size group of aggregate and cement. Aggregate shall not be weighed in the same batcher with cement. If measured by weight, water shall not be weighed cumulatively with another ingredient. Water batcher filling and discharging valves shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed. An accurate mechanical device for measuring and dispensing each admixture shall be provided. Each dispenser shall be interlocked with the batching and discharging operation of the water so that each admixture is separately batched and discharged automatically in a manner to obtain uniform distribution throughout the batch in the specified mixing period. Where use of truck mixers this requirement impracticable, the admixture dispensers shall be interlocked with the sand batcher. Admixtures will not be combined prior to introduction in water or sand. The plant shall be arranged so as to facilitate the inspection of all operations at all times. Suitable facilities shall be provided for obtaining representative samples or aggregates from each bin or compartment.

8.2.2 Scales. The weighing equipment shall conform to the applicable requirements of NBS Handbook 44, except that the accuracy shall be plus or minus 0.2 percent of 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 devices. The tests shall be made at the frequency required in paragraph: CONTRACTOR QUALITY CONTROL and in the presence of a Government inspector.

8.2.3 Batching Tolerances.

8.2.3.1 Weighing Tolerances. Whichever of the following tolerances is greater shall apply, based on required scale reading.

<u>Material</u>	<u>Percent of Required Weight</u>	<u>Percent of Scale Capacity</u>
Cement	+1	+0.3
Aggregate	+2	+0.3
Water	+3	+0.3

8.2.3.2 Volumetric Tolerances. For volumetric batching equipment the following tolerances shall apply to the required volume of material being batched:

- Water: Plus or minus 1 percent.
- Admixtures: Plus or minus 3 percent.

8.2.4 Moisture Control. The plant shall be capable of ready adjustment to compensate for the varying moisture contents of the aggregates, and to change the weights of the materials being batched.

8.3 Mixers.

8.3.1 General. The mixers shall not be charged in excess of the capacity recommended by the manufacturer. The mixers shall be operated at the drum or mixing blade speed designated on the manufacturer's data plate. The mixers shall be maintained in satisfactory operating condition, and the mixer drums shall be kept free of hardened concrete. Should any mixer at any time produce unsatisfactory results, its use shall be promptly discontinued until it is repaired.

8.3.2 Concrete plant mixers shall be tilting, non-tilting, horizontal shaft or vertical-shaft type and shall be provided with an acceptable device to lock the discharge mechanism until the required mixing time has elapsed. The mixing time and uniformity shall conform to paragraph: PRODUCTION OF CONCRETE.

8.3.2.1 Mixing Time and Uniformity. In the absence of uniformity data for concrete mixers, the mixing time for each batch after all solid materials are in the mixer shall be one minute for mixers having a capacity of one cubic yard, provided that all of the mixing water is introduced before one-fourth of the mixing time has elapsed. For mixers of greater capacity, this minimum time shall be increased 15 seconds for each additional cubic yard or fraction thereof. These mixing times are predicated on operation at designated speed and proper introduction of materials into the mixer. The mixing time will be increased to secure the required uniformity when the average variability index for the tests performed in accordance with paragraph: CONTRACTOR QUALITY CONTROL is less than any of the following uniformity requirements:

<u>Test</u>	<u>Average Variability Index</u>
Water content, % by wt.	91.5
Coarse aggregate content, % by wt.	90.5
Unit - weight of air-free mortar, % by wt.	98.5
Cement content of dried mortar, % wt.	82.5

The mixing time may be reduced, when requested by the Contractor, to the minimum time required to meet all the uniformity requirements. Mixer performance tests in accordance with CRD-C 55 at reduced mixing times will be performed by the Government at the Contractor's expense.

8.3.3 Truck Mixers. Truck mixers, the mixing of concrete therein, and concrete uniformity, shall conform to the requirements of ASTM C-94. A truck mixer may be used either for complete mixing (transit-mixed) or to finish the partial mixing done in a stationary mixer (shrink-mixed). Each truck shall be equipped with two counters from which it will be possible to determine the number of revolutions at mixing speed and the number of revolutions at agitating speed. Truck mixers shall not be used to mix or to agitate concrete with greater than 1-1/2-inch nominal maximum size aggregate.

## 9. PREPARATION FOR PLACING.

9.1 Construction Joints. Concrete surfaces to which other concrete is to be bonded shall be prepared for receiving the next lift or adjacent concrete by cleaning with either wet sandblasting, high pressure water jet, or other approved method; however, approved wet sandblasting equipment shall be provided.

9.1.1 High-Pressure Water Jet. A stream of water under a pressure of not less than 3000 psi may be used for cleaning. Its use shall be delayed until the concrete is sufficiently hard so that only the surface skin or mortar is removed and there is no undercutting of coarse aggregate particles. Where the cleaning occurs more than two days prior to placing the next lift or where the work in the area subsequent to the cleaning causes dirt or debris to be deposited on the surface, the surface shall be cleaned again as the last operation prior to placing the next lift. If the water jet is incapable of a satisfactory cleaning, the surface shall be cleaned by wet sandblasting.

9.1.2 Wet Sandblasting. When employed in the preparation of construction joints, wet sandblasting shall be performed as the final operation completed until all accumulated laitance, coatings, stains, debris, and other foreign materials are removed. The surface of the concrete shall then be washed thoroughly to remove all loose material. The surface shall again be washed just prior to placing the succeeding lift.

9.1.3 Waste Disposal. The method used in disposing of waste water employed in cutting, washing and rinsing of concrete surfaces shall be such that the waste water does not stain, discolor, or affect exposed surfaces of the structures, or damage the environment of the project area. Method of disposal shall be subject to approval.

9.2 Embedded Items. Before placing concrete, care shall be taken to determine that all embedded items are firmly and securely fastened in place as indicated on the drawings, or required. Embedded items shall be free of oil and other foreign matter such as loose coatings or rust, paint and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. Voids in sleeves, inserts and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into the voids.

## 10. CONVEYING.

10.1 General. Concrete shall be conveyed from mixer to forms as rapidly as practicable and within the time interval in paragraph: PLACING by methods which will prevent segregation or loss of ingredients. Any concrete transferred from one conveying device to another shall be passed through a hopper which is conical in shape and shall not be dropped vertically more than 5 feet, except where suitable equipment is provided to prevent segregation and where specifically authorized. Telephonic or other satisfactory means of rapid communication between the mixing plant and the forms in which concrete is being placed shall be provided and available for use by Government inspectors.

10.2 Buckets. The interior hopper slope shall be not less than 58 degrees from the horizontal, the minimum dimension of the clear gate opening shall be at least 5 times the nominal maximum size aggregate and the area of the gate opening shall be not less than two-square feet. The maximum dimension of the gate opening shall not be greater than twice the minimum dimension. The bucket gates shall be essentially grout tight when closed and may be manually, pneumatically or hydraulically operated except for buckets larger than 2 cubic yards shall not be manually operated. The design of the bucket shall provide means for positive regulation of the amount and rate of deposit of concrete in each dumping position.

10.3 Trucks. Truck mixers operating at agitating speed or truck agitators used for transporting plant-mixed concrete shall conform to the requirements of ASTM C-94. Non-agitating equipment may be used for transporting plant mixed concrete over a smooth road when hauling time is less than 15 minutes. Bodies of non-agitating equipment shall be smooth, watertight, metal containers equipped with gates that will permit the discharge of the concrete. Covers shall be provided for protection against the weather.

10.4 Chutes. When concrete can be placed directly from a truck mixer, agitator or non-agitating equipment, the chutes attached to this equipment may be used. A discharge deflector shall be used when required by the Contracting Officer. Separate chutes and other similar equipment will not be permitted for conveying concrete except when specifically approved.

10.5 Belt Conveyors. Belt conveyors may be used when approved. Such conveyors shall be designed and operated to assure to uniform flow of concrete from mixer to final place of deposit without segregation of ingredients or loss of mortar and shall be provided with positive means for preventing segregation of the concrete at the transfer points and the point of placing.

10.6 Pump Placement. Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure type. The pipeline shall be rigid steel pipe or heavy duty flexible hose. The inside diameter of the pipe shall be at least three times the nominal maximum size coarse aggregate in the concrete mixture to be pumped but not less than 4 inches. The maximum size coarse aggregate will not be reduced to accommodate the pumps. The distance to be pumped shall not exceed limits recommended by the pump manufacturer. The concrete shall be supplied to the concrete pump continuously. When pumping is completed, concrete remaining in the pipeline shall be ejected without continuation of concrete in place. After each operation, equipment shall be thoroughly cleaned, and flushing water shall be wasted outside of the forms.

## 11. PLACING.

11.1 General. Concrete placement will not be permitted when, in the opinion of the Contracting Officer, weather conditions prevent proper placement and consolidation. Concrete shall be deposited as close as possible to its final position in the forms, and in so depositing there shall be no vertical drop greater than 5 feet except where suitable equipment is provided to prevent segregation and where specifically authorized. Depositing of the concrete shall be so regulated that it may be effectively consolidated in horizontal layers 1-1/2 feet or less in thickness with a minimum of lateral movement. The amount deposited in each location shall be that which can be readily and thoroughly consolidated. The surfaces of construction joints shall be kept continuously wet for the first twelve hours during the twenty-four hour period to placing concrete. Free water shall be removed prior to placement of concrete. Sufficient placing capacity shall be provided so that concrete placement can be kept plastic and free of cold joints while concrete is being placed.

11.2 Time Interval Between Mixing and Placing. Concrete shall be placed within thirty minutes after it has been mixed except when conveyed by agitating equipment. When concrete is truck mixed or when a truck mixer or agitator is used for transporting concrete mixed by a concrete plant mixer, the concrete shall be delivered to the site of the work and discharge shall be completed within 1-1/2 hours after introduction of the cement to the aggregates except when the concrete temperature exceeds 85°F, the discharge shall be completed within 45 minutes. Concrete shall be placed within 15 minutes after it has been discharged.

11.3 Cold-Weather Placing. Concrete shall not be placed without a procedure approved in accordance with paragraph: SUBMITTALS when the concrete is likely to be subjected to freezing temperatures before the expiration of the curing period. The ambient temperature of the space adjacent to the concrete placement and surfaces to receive concrete shall be maintained at not less than 40°F. The placing temperature of the concrete having a minimum dimension less than 12 inches shall be between 60° and 75°F. The placing temperature of the concrete having a minimum dimension greater than 12 inches shall be between 50° and 75°F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperatures. Materials entering the mixer shall be free from ice, snow or frozen lumps. Salt, chemicals or other materials shall not be mixed with the concrete to prevent freezing, except that calcium chloride may be used as an accelerator. The

amount of calcium chloride in the concrete shall not exceed 2 percent by weight of cement being used, and it shall be introduced into the concrete in solution.

11.4 Hot-Weather Placing. Concrete shall be properly placed and finished with approved procedures in accordance with paragraph: SUBMITTALS. The concrete placing temperature shall not exceed 90°F. Cooling of the mixing water and/or aggregates will be required to obtain an adequate placing temperature. An approved retarder may be used to facilitate placing and finishing. Steel forms and reinforcement shall be cooled prior to concrete placement when steel temperatures are greater than 120°F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete placing temperature.

11.5 Concrete on Earth Foundations. Earth surfaces upon which concrete is to be placed shall be clean, damp, and free from frost, ice, and standing or running water. Prior to placing concrete the earth foundation shall have been satisfactorily compacted in accordance with the provisions of Section 2E.

11.6 Consolidation. Immediately after placing, each layer of concrete shall be consolidated by internal vibrating equipment. Vibrators will not be used to transport concrete within the forms. Hand spading may be required if necessary with internal vibration along formed surfaces permanently exposed to view. The vibrating equipment shall at all times be adequate in number of units and power of each unit to properly consolidate the concrete. A spare vibrator shall be kept on the job site during all concrete placing operations. Form or surface vibrators shall not be used unless specifically approved. Vibrators of the proper size, frequency and amplitude shall be used for the type of work being performed in conformance with the following requirements:

<u>Application</u>	<u>Head Diameter (inches)</u>	<u>Frequency VPM</u>	<u>Amplitude (in.)</u>
Thin walls, beams, etc.	1-1/4 - 2-1/2	9000 - 13500	0.02 - 0.04
General construction	2 - 3-1/2	8000 - 12000	0.025 - 0.05

The frequency and amplitude shall be within the range indicated in the table above when determined in accordance with paragraph: CONTRACTOR QUALITY CONTROL. The vibrator shall be inserted vertically at uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if such exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly.

12. REPAIR OF SURFACE DEFECTS. Within 24 hours after form removal, all fins and loose materials shall be removed and surface defects including tie holes shall be remedied. All honeycombed and other defective concrete shall be repaired. All unsound concrete shall be removed from defective areas. Defective areas larger than 36 square inches and deeper than steel or 4 inches shall be delineated in a rectangular shape by a saw cut a minimum depth of 1-inch and repaired with concrete replacement. Minor honeycomb and holes left by the removal of tie rods in all surfaces not to receive additional concrete shall be reamed or chipped and filled with dry pack mortar. If chipping is necessary the edges shall be perpendicular to the surface or slightly undercut. As determined by trial mixtures, the cement used in the mortar or concrete for all surfaces permanently exposed to view shall be a blend of Portland cement and white cement properly proportioned so that the final color when cured will be the same as adjacent

concrete. Temperature of the concrete, ambient air, replacement concrete or mortar during remedial work including curing shall be above 50°F. The prepared area shall be dampened, brush-coated with a neat cement grout or with an approved epoxy resin, and filled with mortar or concrete. The mortar shall consist of 1 part cement to 2-1/2 parts fine aggregate. The quantity of mixing water shall be the minimum necessary to obtain a uniform mixture. The mortar shall be remixed without addition of water until it obtains the stiffest consistency that will permit placing. Mortar shall be thoroughly compacted in place and struck off to adjacent concrete. Replacement concrete shall be drier than the usual mixture and thoroughly tamped into place and finished. Forms shall be used if required. Metal tools shall not be used to finish permanently exposed surfaces. The patched areas shall be cured for seven days.

### 13. FINISHING UNFORMED SURFACES.

13.1 General. The ambient temperature of spaces adjacent to surfaces being finished shall be not less than 50°F. All unformed surfaces that are not to be covered by additional concrete or backfill shall be finished to the elevation shown on the drawings. Surfaces to receive additional concrete or backfill shall be brought to elevation shown on the drawings and left true and regular. Exterior surfaces shall be sloped for drainage unless otherwise shown on the drawing or as directed. Joints shall be carefully made with a jointing tool. The finished surfaces shall be protected from stains or abrasions. Surfaces or edges likely to be injured during the construction period shall be protected from damage. Tolerance for a screeded finish shall be true planes within 3/4-inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction. Tolerance for a floated finish shall be true planes within 1/4-inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction. Tolerance for a troweled finish shall be true planes within 1/8-inch in 10 feet as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

13.2 Float Finish. All unformed surfaces of concrete that are not to be covered by additional concrete or backfill, shall have a float finish unless a steel trowel finish is specified. Surfaces shall be screeded and darried or bullfloated to bring the surface to the required finish level with no coarse aggregate visible. No cement or mortar shall be added to the surface during the finishing operation. The concrete, while still green but sufficiently hardened to bear a man's weight without deep imprint, shall be floated to a true and even plane. Floating may be performed by use of hand or power driven equipment. Hand floats shall be made of magnesium or aluminum.

### 14. CURING AND PROTECTION.

14.1 General. All concrete shall be cured by an approved method for the period of time given below:

Type III Portland cement                      3 days

Type I or II Portland cement                  21 days

Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, mechanical injury and injury from rain and flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the placement site prior to start of concrete placement. Concrete shall be protected from the damaging effects of rain for 12 hours, flowing water for 14 days. All concrete shall be adequately

protected from damage. No fire or excessive heat shall be permitted near or in direct contact with concrete at any time.

14.2 Moist Curing. Concrete moist-cured shall be maintained continuously (not periodically) wet for the entire curing period. If water or curing materials used stain or discolor concrete surfaces which are to be permanently exposed, they shall be cleaned as required in paragraph: EVALUATION AND ACCEPTANCE. When wooden form sheathing shall be kept wet at all times. Horizontal surfaces shall be cured by ponding, by covering with a minimum uniform thickness of 2 inches continuously saturated sand, or by covering with saturated non-staining burlap or cotton mats or sealed impervious sheet materials. The following exceptions are permitted.

14.2.1 Horizontal construction construction joints may be allowed to dry for twelve hours immediately prior to placing of the following lift.

14.2.2 Where insulation is approved for cold weather protection, all joints in the insulation shall be sealed to prevent moisture loss and maintained sealed throughout curing period.

14.3 Membrane Curing. Concrete may be cured with an approved curing compound in lieu of moist curing except that membrane curing will not be permitted on any surface to which sack rubbed finish is to be applied, on any surface containing protruding steel reinforcement. It may be used on surfaces to which concrete or any other materials is to be bonded only under the conditions given in paragraph: CURING AND PROTECTION.

14.3.1 A pigmented type curing compound conforming to CRD-C 300 may be used on surfaces which will not be exposed to view when the project is completed, on surfaces where the appearance of the compound as determined by the Contracting Officer is not objectionable, or on surfaces that are to be painted. It may also be used on surfaces against which concrete is to be bonded, except those to which sack rubbed finish is to be applied or those containing protruding steel reinforcement, provided that it is completely removed by high-pressure water jet or by wet sandblasting described in paragraph: PREPARATION FOR PLACING prior to placing the new concrete. Only a chlorinated rubber base curing compound conforming to CRD-C 300 may be used on surfaces that are to be painted. A non-pigmented type curing compound, containing a fugitive dye, conforming to CRD-C 300 with the reflective requirements waived may be used on surfaces which will be exposed to view when the project is completed.

14.3.2 The curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. The surfaces shall be thoroughly moistened with water and the curing compound applied as soon as free water disappears. The curing compound shall be applied to unformed surfaces as soon as free water has disappeared. The curing compound shall be applied in a 2-coat continuous operation by approved motorized power-spraying equipment and at a uniform coverage of not more than 400 sq. ft. gallon for each coat. Concrete surfaces which have been subjected to rainfall within 3 hours after curing compound has been applied shall be resprayed by the method and at the coverage herein specified. All concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from pedestrian and vehicular traffic and from any other cause which will disrupt the continuity of the curing membrane.

14.4 Impervious-sheet Curing. The following concrete surfaces may be cured using impervious sheets: Channel invert, L-wall footings. All surfaces shall be thoroughly wetted and be completely covered with waterproof paper, polyethylene film or with polyethylene-coated burlap having the burlap thoroughly water-saturated before placing. Covering shall be laid with light colored side up. Covering shall be lapped not less than 12 inches and securely weighted down or shall be lapped not less than 4 inches and taped to form a continuous cover with completely closed joints. The sheet shall be weighted to prevent displacement so that it remains in contact with the concrete during the specified length of curing. Coverings shall be folded down over exposed edges of slabs and secured by approved means. Sheets shall be immediately repaired or replaced if tears or holes appears during the curing period.

14.5 Cold Weather. When the mean daily outdoor temperature is less than 40°F, the temperature of the concrete shall be maintained between 50°F and 70°F for the required curing period. In addition, during the period of protection removal, the air temperature adjacent during the period of protection removal, the air temperature adjacent to the concrete surfaces shall be controlled so that concrete near the surface will not be subjected to a temperature differential of more than 25°F as determined by observation of ambient and concrete temperatures. Curing compounds shall not be used on concrete surfaces which are maintained at curing temperature by use of free steam.

14.6 Hot Weather. When the rate of evaporation of surface moisture, as determined by use of Fig. 2.1.5 of ACI 305, may reasonably be expected to exceed 0.2 lb per sq. ft per hour, provision for windbreaks, shading, fog spraying, or wet covering with a light colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as finishing operations will allow.

## 15. FINISHING FORMED SURFACES.

15.1 General. Surfaces, unless other type of finish is specified, shall be left with the texture imparted by the forms except defective surfaces shall be repaired in accordance with paragraph: REPAIR ON SURFACE DEFECTS. Unless painting of surfaces is required, uniform color shall be maintained by use of only one mixture design without changes in materials or proportions for any structure or portion of structure which is exposed to view or on which a special finish is required. The form panels used to produce the finish shall be orderly in arrangement, with joints between panels planned in approved relation to opening, building corners and other architectural features. Forms shall not be reused if there is any evidence of surface wear or defects which would impair the quality of the surface.

## 17. CONTRACTOR QUALITY CONTROL.

17.1 General. The Contractor shall perform the inspection and tests described herein and based upon the results of these inspections and tests he shall take the action required. Reports shall be submitted as required.

### 17.2 Inspection Details and Frequency of Testing.

#### 17.2.1 Fine Aggregate.

17.2.1.1 Grading. At least once during each shift in which concrete is being delivered, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136 and C 125, respectively, for the fine aggregate. The

locations at which samples are taken may be selected by the Contractor as the most advantageous for control. However, the Contractor as the most advantageous for control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits.

17.2.1.2 Moisture Content. There shall be when in the opinion of the Contracting Officer the electric moisture meter is not operating satisfactorily at least four tests for moisture content in accordance with either ASTM C 70, C 566, or CRD-C 112 during each 8-hour period of mixing plant operation. The times for the tests shall be selected randomly within the 8-hour period. An additional test shall be made whenever the slump is shown to be out of control or excessive variation in workability is reported by the placing foreman. When the electric moisture meter is operating satisfactorily, at least two direct measurements of moisture content shall be made per week to check the calibration of the meter.

#### 17.2.2 Coarse Aggregate.

17.2.2.1 Grading. At least once during each shift concrete is being delivered, there shall be a sieve analysis in accordance with ASTM C 136 for each size group of coarse aggregate. The location at which samples are taken may be selected by the Contractor as the most advantageous for production control. However, the Contractor is responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken shall show the results of the 5 most recent tests including the current test. The Contractor may adopt limits for control coarser than the specification limits for samples taken other than at the batch plant bins to allow for degradation during handling.

17.2.2.2 Moisture Content. A test for moisture content of each size of coarse aggregate shall be made at least once a shift. When two consecutive readings for smallest size coarse aggregate differ by more than 1.0 percent, frequency of testing shall be increased to that specified for fine aggregate.

17.2.3 Deleterious Substances. When in the opinion of the Contracting Officer, a problem exists in connection with deleterious substances in fine or coarse aggregates, tests shall be made in accordance with ASTM C 33. Testing frequency shall be not less than one per week.

#### 17.2.4. Scales.

17.2.4.1 Weighing Accuracy. The accuracy of the scales shall be checked by test weights at least once a month for conformance with the applicable requirement of paragraph: PRODUCTION OF CONCRETE. Such tests shall also be made whenever there are variations in properties of the fresh concrete which could result from batching errors.

17.2.4.2 Batching Accuracy. Once a week the accuracy of each batching device shall be checked during a weighing operation by noting and recording the required weight, and the actual weight batched.

17.2.5 Batch-Plan Control. When the concrete plant is operating the measurement of all constituent materials including cement, each size of aggregate, water and admixtures shall be continuously controlled. The aggregate weights and amount of added water to compensate for free moisture in the aggregates shall be adjusted as necessary. The amount of air-entraining admixture shall be adjusted to control air content within specified limits. A report shall be prepared indicating type and source of cement used, amount and source of admixtures used, aggregate source, the

required aggregate and water weights per cubic yard, amount of water as free moisture in each size of aggregate, and the batched aggregate and water weights per cubic yard for each class of concrete batched during plant operation.

#### 17.2.6 Concrete.

17.2.6.1 Air Content. At least two tests for air content shall be made on randomly selected batches of each class of concrete during each 8-hour period of concrete production. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Tests shall be made in accordance with ASTM C 231. The average of each set of two tests shall be plotted on a control chart on which the average is set at 5.0 percent and the upper and lower control limits at 6.0 and 4.0 percent respectively. The range shall be plotted on control chart on which the upper control limit is 2.0 percent. For concrete having a nominal maximum aggregate size of 3/4-inch, the average shall be set at 6.0 percent and the lower and upper control limits at 5.0 and 7.0 percent respectively.

17.2.6.2 Slump. At least two slump tests shall be made on randomly selected batches of each mixture of concrete during each day's concrete production in accordance with ASTM C 143. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. The average of each set of two tests shall be plotted on a control chart on which the average is that stipulated in paragraph: PROPORTIONING and the upper and lower limits are set 1.0 inch above and below the average. The range shall be plotted on a control chart on which the upper control limit is 2.0 inches.

17.2.7 Preparation for Placing. Foundation or construction joints, forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer it is ready to receive concrete. The results of each inspection shall be reported in writing.

17.2.8 Placing. The placing foreman shall supervise all placing operations, shall determine that the correct quality of concrete or grout is placed in each location as directed by the Contracting Officer and shall be responsible for measuring and recording concrete temperatures, ambient temperature, weather conditions, time of placement, yardage placed, and method of placement.

17.2.9 Vibrators. The frequency and amplitude of each vibrator shall be determined prior to initial use and at least once a month when concrete is being placed. Additional tests shall be made when a vibrator does not appear to be adequately consolidating the concrete. A vibrating reed tachometer or resonant reed tachometer shall be used for checking frequency. The frequency shall be determined while the vibrator is operating in concrete holding the tachometer against the upper end of the vibrator while almost submerged and just before the vibrator is withdrawn from the concrete. The amplitude shall be determined with the head vibrating in air. For flexible shaft electric and air vibrators, two measurements shall be taken, one near the tip and another near the upper end of the vibrator head, and these results averaged. For other types of internal vibrators, measurements shall be taken in accordance with ACI 309. A visual effect scales (optical wedge), as shown in ACI 309 or obtained from the vibrator manufacturer, shall be attached to the vibrator where required with the "V" parallel to the axis of the vibrator. The make, model, type and size of the vibrator and frequency and amplitude results shall be reported in writing.

### 17.2.10 Curing.

17.2.10.1 Moist Curing. At least once each shift an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded.

17.2.10.2 Curing Compound. No curing compound shall be applied until it has been verified that the compound is properly mixed and ready for spraying. At the end of each operation the quantity of compound used and the area of concrete surface covered shall be reported and the rate of coverage in square feet per gallon shall be computed. The report shall state whether coverage is uniform.

17.2.10.3 Impervious Sheet Curing. At least once each shift an inspection shall be made of all areas being cured using impervious sheets. The condition of the covering and the tightness of the laps and tapes shall be noted and recorded.

17. 2.11 Protection. At least once each shift an inspection shall be made of all areas subject to cold weather protection. Deficiencies shall be noted. During removal of protection, measurement of concrete and ambient temperature shall be made at least hourly.

### 17.2.12 Mixer Uniformity.

17.2.12.1 Concrete Plant Mixer. At the start of concrete placing, and at least once every three months when concrete is being placed, uniformity of concrete shall be determined. The initial and every fourth test shall be performed in accordance with regular test of CRD-C 55. Other tests shall be performed in accordance with abbreviated tests of CRD-C 55. Whenever adjustments in mixer or increase mixing times are necessary because of failure of any mixer to comply, the mixer shall be retested after adjustment. For complete testing three different batches of concrete shall be tested. For abbreviated tests one batch shall be tested. Results of tests shall be reported in writing.

17.2.12.2 Truck Mixers. AT the start of concrete placing and at least once every three months when concrete is being placed, uniformity of concrete shall be determined in accordance with ASTM C 94. The truck mixers shall be selected randomly for testing. When satisfactory performance is found in one truck mixer, the performance of mixers of substantially the same design and condition of blades may be regarded as satisfactory. Results of tests shall be reported in writing.

### 17.3 Action Required.

#### 17.3.1 Fine Aggregate.

17.3.1.1 Grading. When the amount passing any sieve is outside the specification limits, the fine aggregate shall immediately be resampled and retested. If there is another failure on any sieve, the fact shall immediately be reported to the Contracting Officer, and immediate steps shall be taken to rectify the situation.

17.3.1.2 Moisture Content. Whenever the moisture content of the fine aggregate changes by 0.5 percent or more, the scale settings for the fine aggregate batcher and water batcher shall be adjusted directly or by means of a moisture compensation device.

### 17.3.2 Coarse Aggregate.

17.3.2.1 Grading. When the amount passing any sieve is outside the specification limits, the coarse aggregate shall immediately be resampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Contracting Officer. When two consecutive averages of 5 tests are outside of specification limits, that fact shall be reported to the Contracting Officer and immediate steps shall be taken to correct the grading.

17.3.2.2 Moisture Content. Whenever the moisture content of the smallest size of coarse aggregate changes by 0.5 percent or more, the scale settings for the aggregate batcher and water batcher shall be adjusted directly or by means of a moisture compensation device.

17.3.3 Deleterious Substances. When the results for a deleterious substance is outside the specification limit, the aggregate shall be resampled and retested for the deleterious substance that failed. If the second sample fails, that fact shall be reported to the Contracting Officer. When material finer than No. 200 sieve for coarse aggregate exceeds specification limit, immediate steps, such as washing or other corrective actions, shall be initiated.

17.3.4 Scales. Whenever either the weighing accuracy or batching accuracy is found not to 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.

### 17.3.5 Concrete.

17.3.5.1 Air Content. Whenever points on the control chart approach the upper or lower control limits an adjustment should be made in the amount of air-entraining admixture batched. If a single test result is outside the specification limit such adjustment is mandatory. As soon as practical after each adjustment another test shall be made to verify the correctness of the adjustment. Whenever a point falls above the upper control limit for range, the dispenser shall be calibrated to insure that it is operating correctly and with good reproducibility. Whenever two consecutive points either for average or range are outside the control limits, the Contracting Officer shall be notified. Whenever the air content departs from the specified range, the concrete shall not be delivered to the forms.

17.3.5.2 Slump. Whenever points on the control chart approach the upper or lower control limits an adjustment should be made in the batch weights of water and fine aggregate. When a single slump is outside the control limits such adjustment another test shall be made to verify the correctness of the adjustment. Whenever the slump departs from the stipulated in paragraph: PROPORTIONING more than 1-1/2 inches the concrete shall not be delivered to the forms. Whenever two consecutive slump tests, made during a period when there was no adjustment of batch weights, produce a point on the control chart for range above the upper control limit, the slump shall be considered to be out of control and the additional testing for aggregate moisture content shall be undertaken.

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

### 17.3.7 Curing.

17.3.7.1 Moist Curing. When a daily inspection report lists an area of inadequate curing, the required curing period for that area shall be extended by one day.

17.3.7.2 Curing Compound. When the coverage rate of curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

17.3.7.3 Impervious Sheet Curing. When a daily inspection report lists any tears, holes or laps of joints that are not completely closed, the tears and holes shall promptly be repaired or the sheets replaced, the joints closed, and the required curing period for those areas shall be extended by one day.

17.3.8 Protection. Whenever any concrete temperature during the period of protection or protection removal fails to comply with the specifications, that fact shall be reported to the Contracting Officer and immediate steps should be taken to correct the situation.

17.3.9 Mixer Uniformity. When a mixer fails to meet mixer uniformity requirements, either the mixing time shall be increased or adjustments shall be made to the mixer until compliance is achieved.

17.4 Reports. All results of tests conducted at the project site shall be reported weekly and shall be delivered to a designated representative of the Contracting Officer within 3 days after the end of each weekly reporting period. Each weekly report shall include the updating of control charts covering the entire period from the start of the construction season through the current week. During periods of cold weather protection, reports of pertinent temperatures shall be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in preceding paragraphs. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all Contractor quality control records.

\* \* \* \* \*

SECTION 3E

PNEUMATICALLY PLACED CONCRETE

Index

- |                             |                                |
|-----------------------------|--------------------------------|
| 1. Applicable Publications  | 6. Preparation of Surfaces     |
| 2. Usage                    | 7. Placing                     |
| 3. Description              | 8. Finishing                   |
| 4. Materials                | 9. Curing and Protection       |
| 5. Proportioning and Mixing | 10. Contractor Quality Control |

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

1.1 American Society for Testing and Materials (ASTM) Publications.

C 33-78 Concrete Aggregates

1.2 American Concrete Institute (ACI) Standard

ACI 304-73 (R 1978) Recommended Practice for Measuring,  
Mixing, Transporting, and Placing Concrete

2. USAGE. At the option of the Contractor pneumatically placed concrete may be used in lieu of poured-in-place concrete for the side drain.

3. DESCRIPTION. Pneumatically placed concrete shall be produced by either the dry mixed process in which most of the mixing water is added to the dry materials immediately prior to its expulsion from the nozzle, or the wet mix process in which all of the materials (including water) are premixed before entering the delivery hose.

4. MATERIALS.

4.1 Portland Cement shall conform to the requirements of section: Cast-in Place structural concrete.

4.2 Fine Aggregate shall conform to the requirements of ASTM C 33. Fine aggregate shall contain not less than 3 percent nor more than 6 percent moisture by weight, and shall conform to the following:

Sieve Opening	Percent by Weight, Passing
3/8 inch	100
No. 4	95-100
No. 8	65-90
No. 16	45-75
No. 30	30-50
No. 50	10-22
No. 100	2-8

4.3 Water for mixing and curing shall be clean, fresh and free from injurious amounts of mineral and organic substances.

4. Reinforcement. Reinforcement shall conform to the section: CONCRETE REINFORCEMENT.

5. PROPORTIONING AND MIXING.

5.1 Dry Mix Process. The dry mixture shall consist of one part Portland cement to not more than 4-1/2 parts of fine aggregate. Measurement may be either by volume or weight. The material shall be mixed dry in an approved power batch mixer equipped with accurate measuring and timing devices and capable of thoroughly mixing the fine aggregate and sand in sufficient quantity to maintain placing continuity. The mixing time shall be as recommended by the manufacturer of the mixer except that the mixing time shall be not less than one minute in drum-type mixers. Mixers shall be capable of discharging all mixed material without any carryover between batches. Materials that have been mixed for more than 45 minutes have not been incorporated into the work shall not be used.

5.2 Wet Mix Process. The premixed concrete shall contain not less than 6-1/2 sacks of Portland cement per cubic yard of fine aggregate and water. A maximum of 30 percent pea gravel may be substituted for an equal amount of fine aggregate. The maximum size of pea gravel shall be such that 100 percent passes the 1/2 inch screen and at least 90 percent passes the 3/8 inch screen. Measurement may be either by volume or weight. The mixing equipment shall be capable of thoroughly mixing the materials in sufficient quantity to maintain continuous placing. The required mixing time shall depend on the mix being used and the efficiency of the mixer. Mixing shall conform to ACI 304. Non-agitating hauling equipment may be used subject to the approval of the Contracting Officer.

5.3 Strength. Pneumatically placed concrete shall have a minimum compressive strength of not less than 4,000 pounds per square inch at 28 days.

6. PREPARATION OF SURFACES.

6.1 Preparation of Foundation. Areas to receive pneumatically placed concrete shall be thoroughly compacted and trimmed to line and grade with sufficient moisture to provide a firm foundation and prevent absorption of water from the concrete. No free water shall be present on the surface. Ground or gaging wires shall be used where necessary to establish thicknesses, surface planes and finish lines.

7. PLACING.

7.1 Workmen. Only experienced foremen, gunmen, nozzle men, and rodmen shall be employed and satisfactory written evidence of such experience shall be furnished the Contracting Officer or his representative upon demand.

7.2 Equipment. The Contractor shall provide delivery equipment of approved design which will apply the material by means of pneumatic pressure. Air shall be supplied in sufficient volume and under such pressure as may be necessary for the best operating volume and under such pressure as may be necessary for the best operating conditions. Air pressure at the nozzle shall be steady and without pulsation. A constant pressure of not less than 45 pounds per square inch shall be maintained in the placing machine where the hose length is 100 feet or less and the pressure shall be increased at least 5 pounds for each additional 50 feet of hose or fraction thereof. Water used for hydration at the nozzle shall be maintained at a uniform pressure not less than 15 pounds per square inch greater than the air pressure at the machine.

7.3 Applying. The nozzle shall be held as nearly perpendicular as possible to the surface to which the mortar is applied, at such distance and narrow range of movement as will produce a spreading effect over a small area. The velocity of discharge from the nozzle, the distance of the nozzle from the face, and the amount of water used shall be regulated by the nozzle men in such a way as will produce a dense coating resulting in a minimum rebound of materials and no sloughing. Rebound material shall not be used again but shall be removed from the work. The maximum thickness of each layer will be limited to the thickness which can be placed without the material sagging. Time between application of layers shall be only sufficient to insure against sloughing. In case a portion of the previous layer has set to such hardness or has become coated in a manner preventing adequate bonding, the surface of that layer shall be cleaned by air and water jets before starting the next layer. Construction joints shall be avoided. Where necessary, at the end of the day's work or similar stopping periods, the concrete shall be tapered to a thin edge. Before applying the adjacent section, this tapered portion shall be thoroughly cleaned and wetted.

7.4 Clean-up. At the completion of each day's work, or as otherwise directed. All accumulations of pneumatically placed concrete on adjacent surfaces shall be removed.

8. FINISHING. After the concrete has been placed to the required thickness the surface shall be checked with a straightedge and any low spots or depressions shall be filled.

8.1 Wood Float Finish. All surfaces shall receive a wood float finish. After the concrete has taken an initial set (crumbling slightly when cut) the surfaces shall be screeded with straightedges and when surface moisture disappears, the surfaces finished to an even granular textured surface with a wood float.

9. CURING AND PROTECTION. Curing and protection shall conform to the requirements of section: CAST-IN-PLACE STRUCTURAL CONCRETE.

10. CONTRACTOR QUALITY CONTROL.

10.1 General. The Contractor shall perform the following inspections and tests, and based upon the results of these inspections and tests, he shall take such action and submit reports as hereinafter specified.

10.2 Inspection Details and Frequency of Testing.

10.2.1 Preparation of Placing. Foundation, forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer it is ready to receive concrete. The results of each inspection shall be reported in writing.

10.2.2 Placing. The placing foreman shall supervise all placing operations and shall be responsible for measuring and recording ambient temperature, weather conditions, time of placement, yardage placed, and method of placement.

10.2.3 Compressive Strength. The Contractor shall provide for test purposes 2 test panels from each-8-hour shift. Each panel shall be not less than 12 inches square and 3 inches in thickness. Cubes, 3 x 3 x 3 inches in size shall be sawed from the panels for testing. One half of the cubes shall be tested at 7 days and one half at 28 days. Panels shall be cured, stored and tested by and at the expense of the Contractor. Cube strengths may be reported as determined or converted to cylinder strengths by multiplying by the factor 0.85. Test results shall be reported in writing.

#### 10.2.4 Curing.

10.2.4.1 Curing Compound. No curing compound shall be applied until the Contractor's authorized representative has verified that the compound is properly mixed and ready for spraying. At the end of each operation he shall estimate the quality of compound used and the area of concrete surface covered and compute the rate of coverage in square feet per gallon. He shall note whether coverage is uniform.

#### 10.3 Action Required.

10.3.1 The placing foreman shall not permit placing to continue when material is not uniform at the nozzle or the material is not being applied at proper velocity for good compaction. Immediate steps shall be taken to correct these conditions.

#### 10.3.2 Curing.

10.3.2.1 Curing Compound. When the coverage rate of curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

10.3.3 Compressive Strength. When laboratory-cured specimens fail to conform to the requirements for strength, the Contractor shall change the proportions or the water contents, or both, for the remaining portions of the work.

10.4 Reports. All result of tests conducted at the project site shall be reported weekly and shall be delivered to a designated representative of the Contracting Officer within 3 days after the end of each weekly report period. Each weekly report shall include the updating of control charts covering the entire period from the start of the construction season through the current week. During periods of cold weather protection, reports of pertinent temperatures shall be made daily. These requirements do not relieve the Contractor of the obligation to report certain failures immediately as required in preceding paragraphs. Such reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all Contractor quality control records.

\* \* \* \* \*

SECTION 3F

GROUTING STONE PROTECTION

Index

- |                            |            |
|----------------------------|------------|
| 1. Applicable Publications | 3. Mixing  |
| 2. Materials               | 4. Placing |

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

1.1 Federal Specifications (Fed. Spec.).

- |              |   |
|--------------|---|
| SS-C1960/GEN | Cement and Pozzolan, General Requirements for |
| SS-C-1960/3  | Cement, Portland                              |

1.2 American Society for Testing and Materials (ASTM), Publications.

- |        |                     |
|--------|---------------------|
| C33-80 | Concrete Aggregates |
|--------|---------------------|

1.3 U.S. Department of the Army, Corps of Engineers, Handbook for Concrete and Cement.

- |              |  |
|--------------|--|
| CRD-C 300-77 | Membrane-Forming Compounds for Curing Concrete |
|--------------|--|

2. MATERIALS.

2.1 Aggregate shall conform to the requirements specified for fine aggregate of the section: CAST-IN-PLACE STRUCTURAL CONCRETE.

2.1 Aggregate.

2.1.1 General. Aggregate as delivered to the mixers, shall consist of clean, hard, uncoated particles, and shall conform to ASTM, C, 33. The Contractor shall designate in writing within 15 days after date of notice to proceed the source or sources from which he proposed to furnish the aggregate and submit certification from an approved testing laboratory that aggregates to be furnished meet the requirements of these specifications.

2.1.2 Gradation. The aggregate shall conform to the following specific requirements.

Sieve Designation, U.S. Standard Square Mesh	Percentage by Weight Passing
3/8 in.	100
No. 4	95-100
No. 8	80-90
No. 16	55-75
No. 30	30-60
No. 50	12-30
No. 100	3-10

In addition to the grading limits shown above, the aggregate, as delivered to the mixer, shall have a fineness modulus of not less than 2.40 or more than 2.90. The grading of the aggregate shall also be controlled so that the fineness moduli of at least 9 to 10 test samples of the aggregate as delivered to the mixer shall not vary more than 0.15 from the average fineness modulus of all samples previously taken. The fineness modulus shall be determined by dividing by 100, the sum of the cumulative percentages retained on U.S., Standard Sieves Nos., 4, 8, 16, 30, 50, and 100. At the option of the Contractor, aggregate may be separated into 2 or more sizes or classifications, but the resulting combined sand shall be of uniform grading within the limits specified above.

2.2 Portland Cement shall conform to the requirements of Fed. Spec. SS-C-1960.3, Type I and/or Type II. The alkali content of the cement shall not exceed 0.6 percent.

2.3 Water shall be fresh, clean, and potable.

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

4. PLACING. Prior to grouting, the stone shall be furnished with water to wash down the fines and to prevent absorption of water from grout. The stone shall be kept wet just ahead of the actual placing of grout. The grout shall be placed in one course in invert and in 2 courses in side slopes. Each course shall be placed full width or in successive lateral strips approximately 10 feet in width, as applicable, extending from toe of slope to top on side slopes. The grout shall be brought to the place of final deposit by approved means and discharged directly on the stones using a splash plate of metal or wood to prevent displacement of stone directly under the discharge. The flow of grout shall be directed with brooms or other approved baffles to cover the entire area and to assure that all crevices are filled. Sufficient barring shall be done to loosen tight pockets of stone and otherwise aid the penetration of grout. The first course shall fully penetrate the stone blanket. The second course shall be placed as soon as the first course has sufficiently stiffened so that it will not flow when additional grout is added. On side slopes, all brooming shall be uphill, and after the second course has stiffened the entire surface shall be rebroomed to eliminate runs in the top course and to fill voids caused by sloughing of the layers of grout. After completion of any strip or panel, no workmen or other load shall be permitted on the grouted surface for a period of 24 hours. The grouted surface shall be protected from injurious action of the sun; shall be protected from rain, flowing water, and mechanical injury; and shall be moist cured or membrane cured at the Contractor's option. Moist curing shall consist of covering the grout with a uniform thickness of 2 inches of sand which shall be kept continuously saturated for a period of 14 days.

Membrane curing compound shall be a pigmented curing compound, conforming to Corps of Engineers Serial No. CRD-C 300.

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

\* \* \* \* \*

US ARMY CORPS OF ENGINEERS, LOS ANGELES  
300 North Los Angeles Street  
Los Angeles, California

ARMY - C. of E. - Los Angeles