SPECIFICATIONS
(FOR CONSTRUCTION CONTRACT)

Solicitation No. DACW45-02-B-0014

Flood Protection Project
Van Bibber Creek

Arvada, CO

May 2003

US Army Corps
of Engineers
Omaha District

Flood Protection Project
Van Bibber Creek
Arvada, CO

PROJECT TABLE OF CONTENTS

CONTRACT REQUIREMENTS

00010 Solicitation, Offer and Award (SF-1442)
00100 Instructions, Conditions & Notices to Bidders
00600 Representations, Certifications & Other Statements of Bidders
00700 Contract Clauses
00800 Special Contract Requirements

DIVISION 01 - GENERAL REQUIREMENTS

01040 AS-BUILT DRAWINGS
01200 CONSTRUCTION GENERAL
01330 SUBMITTAL PROCEDURES
01355A ENVIRONMENTAL PROTECTION
01356 STORM WATER POLLUTION PREVENTION MEASURES
01400 SPECIAL SAFETY REQUIREMENTS
01451 CONTRACTOR QUALITY CONTROL
01550 MEASUREMENT AND PAYMENT
01568 (NON-FEDERAL FACILITIES COLOARDO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGE FROM CONSTRUCTION SITES
01900 CONSTRUCTION PHASING AND SCHEDULE RESTRICTIONS

DIVISION 02 - SITE WORK

02050 DEMOLITION
02110 CLEARING AND GRUBBING
02210 GRADING
02222 EXCAVATION, TRENCHING, AND BACKFILLING FOR STRUCTURES AND UTILITIES SYSTEMS
02240 STONE (RIPRAP) PROTECTION
02241 CRUSHED AGGREGATE
02246 GROUTED STONE BOULDER CONSTRUCTION
02373 GEOTEXTILE
02440 TRAFFIC SIGNS
02511 CONCRETE SIDEWALKS AND CURBS AND GUTTERS
02552 BASE COURSES, BITUMINOUS SURFACE COURSES, AND BITUMINOUS TACK AND PRIME COATS
02580 PAVEMENT MARKINGS
02720 STORM-DRAINAGE SYSTEM
02915 CUTTINGS
02921 SEEDING
02930 TREES

DIVISION 03 - CONCRETE

03100 STRUCTURAL CONCRETE FORMWORK
03200 CONCRETE REINFORMCEMENT
03250 EXPANSION JOINTS, CONTRACTION JOINTS AND WATERSTOPS USED IN CONCRETE

03301 CAST-IN-PLACE STRUCTURAL CONCRETE

DIVISION 05 - METALS

05055 METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS

DIVISION 16 - ELECTRICAL

16375A ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND

-- End of Project Table of Contents --

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACW45-02-B-0014	☒ SEALED BID (IFB) ☐ NEGOTIATED (RFP)	19 May 2003	1 OF 4

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

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.

7. ISSUED BY CODE CT

U S ARMY ENGINEER DISTRICT, OMAHA
106 South 15th Street
Omaha, Nebraska 68102-1618

8. ADDRESS OFFER TO

U.S.ARMY CORPS OF ENGINEERS, OMAHA
Attn: CONTRACTING DIVISION (CENWO-CT)
106 South 15th Street
Omaha, Nebraska 68102-1618

9. FOR INFORMATION CALL: ▶	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)
	See SECTION 00100, Para. 25	See SECTION 00100, Para. 25

SOLICITATION

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

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

The Offeror hereby agrees to do all the work described in these documents entitled:

Flood Protection Project
Van Bibber Creek
Arvada, CO

RETURN WITH BIDS: SECTION 00010 (SF1442), SECTION 00600 REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF BIDDERS, and all Bonding Requirements, See SECTION 00700 CONTRACT CLAUSES and SECTION 00100 for Performance and Payment Bonds.

11. The Contractor shall begin performance within 10 calendar days and complete it within 730 calendar days after receiving

☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. (See _____ .)

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

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 2:00 pm (hour) local time 18 Jun 2003 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☒ is, ☐ is not required.

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

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

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

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within 60 calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)

AMOUNTS ▶ SEE ATTACHED BIDDING SCHEDULE

Contractor's Fax No._____ CAGE CODE _____

Contractor's E-Mail address_____

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

19. ACKNOWLEDGMENT OF AMENDMENTS

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

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)	20B. SIGNATURE	20C. OFFER DATE

AWARD (To be completed by Government)

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified) ▶	ITEM 26	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

26. ADMINISTERED BY CODE	27. PAYMENT WILL BE MADE BY
U.S. Army Engineer District, Omaha 106 South 15th Street Omaha, Nebraska 68102-1618	USAED Omaha c/o USACE Finance Center 5722 Integrity Drive Millington, TN 38054-5005

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

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

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

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

BIDDING SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
1.	All work, complete, for Clearing and Grubbing, as shown on the Drawing and Specs	Job	LS	--	$_____
2.	All work, complete, for Excavation, as shown on the Drawing and Specs	Job	LS	-	$_____
3.	All work, complete, for Compacted Embankments and Grading, As shown on the Drawing and Specs	Job	LS	--	$_____
4.	All work, complete, for Topsoil and Placement of Organic Wetland Soil, as shown on the Drawing and Specs	Job	LS	--	$_____
5.	All work, complete, for Seeding, Mulching, and Plantings, As shown on the Drawing and Specs	Job	LS	--	$_____
6.	All work, complete, for Riprap and Grouted Stone Boulder Construction, as shown on the Drawing and Specs	Job	LS	--	$_____
7.	All work, complete, for Concrete, as shown on the Drawing and Specs	Job	LS	--	$_____
8.	All work, complete, for Bituminous Pavement and Aggregate Base Course, as shown on the Drawing and Specs	Job	LS	--	$_____
9.	All work, complete, for Water Line Relocation, as shown on the Drawing and Specs	Job	LS	--	$_____
10.	All work, complete, for Utility Modification and Relocation, as shown on the Drawing and Specs	Job	LS	--	$_____
11.	All work, complete, for Dewatering, as shown on the Drawing and Specs	Job	LS	--	$_____
12.	All remaining work	Job	LS	--	$_____
			TOTAL	AMOUNT	$_____ (in figures)

NOTES:

1. Bid prices must be entered for all items of the schedule. Total amount bids submitted without bid prices being entered on individual items will be rejected. Additions will be subject to verification by the Government. In case of variation between the lump-sum prices and the total amount, the lump-sum prices will be considered the bid.

2. A modification to a bid which provides for a single adjustment to the total amount bid, should state the application of the adjustment to each respective lump-sum price and unit price affected. If the modification is not so apportioned, the single adjustment will be applied to Basic Item No. 12.

SECTION 00100

INSTRUCTIONS, CONDITIONS & NOTICES TO BIDDERS
(July 2000, Revised May 2003)

INDEX

Attachments: Required Central Contractor Registration

1 GENERAL BIDDING INFORMATION
2 (FAR 52.214-6) EXPLANATION TO PROSPECTIVE BIDDERS (APRIL 1984).
3 RESERVED
4 (FAR 52.214-5) SUBMISSION OF BIDS (MAR 1997).
5 (FAR 52.214-18) PREPARATION OF BIDS - CONSTRUCTION (APRIL 1984).
6 (FAR 52.214-4) FALSE STATEMENTS IN BIDS (APRIL 1984).
7 (FAR 52.214-7) LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (NOV 1999).
8 INFORMATION FOR MODIFYING BIDS.
9 BID GUARANTEE.
10 PERFORMANCE AND PAYMENT BONDS.
11 (FAR 52.214-19) CONTRACT AWARD - SEALED BIDDING - CONSTRUCTION (AUG 1996).
12 NORTH AMERICAN CLASSIFICATION SYSTEM (NAICS).
13 SMALL BUSINESS SIZE STANDARD.
14 (FAR 52.214-3) AMENDMENTS TO INVITATIONS FOR BIDS (DECEMBER 1989).
15 CHANGES PRIOR TO OPENING BIDS.
16 (FAR 52.214-34) SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)
17 (FAR 52.214-35) SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)
18 (EFARS 52.214-5000) ARITHMETIC DISCREPANCIES.
19 AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.
20 AVAILABLE PLANT.
21 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE.
22 NOTICE REGARDING BUY AMERICAN ACT.
23 COLORADO SALES AND USE TAX.
24 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).
25 BIDDER'S QUESTIONS AND COMMENTS.
26 (FAR 52.233-2) SERVICE OF PROTEST (AUG 1996).
27 PRE-AWARD SURVEY INFORMATION (Local Provision) (Sep 93)
28 (FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)
29 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984).
30 SUBCONTRACTING PLAN/SUBCONTRACTING GOALS REGARDING THE UTILIZATION OF SMALL BUSINESS CONCERNS.
31 (DFARS 252.204-7004) REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001)

SECTION 00100

INSTRUCTIONS, CONDITIONS & NOTICES TO BIDDERS

1 GENERAL BIDDING INFORMATION

Bids shall be either mailed or hand-carried as indicated below. Bid will be PUBLICLY opened at the bid time indicated on Standard Form SF 1442 (Page 00010-1).

1.1 MAILED BIDS AND HAND-CARRIED BIDS

a. Mailed bids shall be addressed to the location as indicated on Standard Form SF 1442 (Page 00010-1), Item No. 8.

b. Due to heightened security at Government installations, those bidders who have their bids hand-carried* shall contact Neil Herman, Contract Specialist at (402) 221-4119 or (402) 221-4100 prior to delivering to the U. S. Army Corps of Engineer District, Omaha, 106 South 15th Street, Omaha, NE.

c. On the date specified and for thirty (30) minutes prior to time specified on Standard Form SF 1442, Page 00010-1, item 13.A, a Contracting representative will be in the lobby to receive bids. At the time specified on Standard SF 1442 Page 00010-1, item 13.A, the designated bid opening official will announce that receipt of bids is closed. Official time will be established by time/stamp clock located in the area where bids are received.

d. Anyone wishing to attend this public opening will be required to present photo identification to sign in and then will be escorted to the facility where bids will be opened. Once bids have been opened, read and recorded, attendees will then be escorted to exit the building.

e. **RETURN ADDRESS REQUIREMENTS**

Bidder(s) must ensure that **ALL** mail sent to the Omaha District, U.S. Army Corps of Engineers, either pre-contract or post-contract award, has a return mailing address on the outside of the envelope, package, box, etc. **ANY MAIL** addressed to the U.S. Army Corps of Engineers, including but not limited to bids, modifications to bids, proposals, revised proposals, bid guarantees, bonds, correspondence, etc., **will be REJECTED** by the US Army Corps of Engineers mail room facility located at 106 South Street, Omaha, Nebraska 68102-1618 if it does not contain a return mailing address. **There will be no exceptions.**

*This instruction shall also apply to those bids delivered through a delivery or parcel service.

1.2 SOLICITATION RESTRICTIONS

This solicitation is unrestricted and open to both large and small business participation.

1.3 BASIS FOR AWARD.

IT IS INTENDED THAT AWARD WILL BE MADE TO ONE BIDDER FOR THE ENTIRE WORK.

1.4 APPROPRIATION AND AUTHORITY

APPROPRIATION: 96 X 3122 Construction General

AUTHORITY: The work provided for herein is authorized: Section 205 of the Flood Control Act of 1948 (PL 80-858), as amended.

1.5 DESCRIPTION OF WORK

The scope of this project is to furnish all plant, labor, materials, and equipment and performing all work for the flood control channel improvements project consisting of the construction of a conduit in the downstream segment and an open channel in the upstream segment. The underground conduit will consist of a twin reinforced cast-in-place concrete box conduit. The open channel segments consist of excavated channels, reinforced concrete open channels, grouted stone drops, and a roadway bridge. Also included are pavement removal and placement, utility work, seeding, tree planting, drainage structure modifications, pavement striping, and site demolition and clearing.

1.6 ESTIMATED CONSTRUCTION COST

The estimated construction cost of this project is between $7,500,000 and $10,000,000.

2 (FAR 52.214-6) EXPLANATION TO PROSPECTIVE BIDDERS (APRIL 1984).

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

3 RESERVED

(NOTE: FACSIMILE, ELECTRONIC COMMERCE OR TELEGRAPHIC BIDS ARE NOT AUTHORIZED AND WILL NOT BE ACCEPTED. TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS ARE AUTHORIZED. FACSIMILE MODIFICATIONS OR WITHDRAWAL ARE NOT AUTHORIZED.)

4 (FAR 52.214-5) SUBMISSION OF BIDS (MAR 1997).

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

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

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

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

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

5 (FAR 52.214-18) PREPARATION OF BIDS - CONSTRUCTION (APRIL 1984).

(a) Bids must be--

(1) Submitted on the forms furnished by the Government or on copies of those forms, and
(2) **Manually signed.** The person signing a bid must initial each erasure or change appearing on any bid form.

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

(1) Lump sum bidding;

(2) Alternate prices;

(3) Units of construction; or

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

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

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

6 (FAR 52.214-4) FALSE STATEMENTS IN BIDS (APRIL 1984).

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

(NOTE: FACSIMILE, ELECTRONIC COMMERCE OR TELEGRAPHIC BIDS ARE NOT AUTHORIZED AND WILL NOT BE ACCEPTED. TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS ARE AUTHORIZED. FACSIMILE MODIFICATIONS OR WITHDRAWAL ARE NOT AUTHORIZED.)

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

(NOV 1999).

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

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

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

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

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

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

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

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

(End of provision)

8 INFORMATION FOR MODIFYING BIDS.

Bids which have been delivered to the designated bid receiving office may be modified or withdrawn by mail, mailgram, or telegram received at any time before the exact time set for receipt of bids. Modifications or withdrawals sent by mail should be transmitted to the place of bid opening Standard Form SF1442 (Page 00010-1), Item 8. Telephone modifications or withdrawals, other than telecopier, will not be accepted. All bid modifications or withdrawals must be signed by the bidder or its authorized representative. Any questions regarding these procedures should be directed to the Omaha District's Contracting Division at (402) 221-4119. This number should also be used to verify the receipt of messages.

9 BID GUARANTEE.

See Contract Clauses clause FAR 52.228-1, BID GUARANTEE. Bid guarantee MUST be in an original and accompanied by an original power of attorney of the surety. Bidders are reminded that a bid bond is required under the solicitation. Proper bid bonds and documents related to the bid bond are a matter of responsiveness that may not be corrected after bid opening. The Comptroller General of the General Accounting Office has issued a recent decision that may impact acceptability of bid bonds and related documents. The case, All Seasons Construction, Inc, B-291166.2, December 6, 2002, concluded that, in order for the bid to be responsive, signatures (including mechanically-produced signatures) must be added to powers of attorney **after** generation from a computer printer. It may be found at the GAO website at <<http://www.gao.gov/decisions/bidpro/bidpro.htm>>. Bidders are encouraged to refer to this case for guidance prior to submitting their bids.

(This provision is Not Required for projects less than $100,000. See paragraph: PAYMENT PROTECTION.)

10 PERFORMANCE AND PAYMENT BONDS.

See Contract Clauses clause FAR 52.228-15, PERFORMANCE AND PAYMENT BONDS. To have the bond considered valid, both the bond and the Power of Attorney must be original. Facsimile copies will not be acceptable, and will render the bid invalid, therefore eliminating it from competition.

(NOTE: FOR THE PURPOSES OF THIS SOLICITATION, THE WORD "ITEM" SHALL BE CONSIDERED TO MEAN "SCHEDULE.")

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

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

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

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

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

12 NORTH AMERICAN CLASSIFICATION SYSTEM (NAICS).

In accordance with NAICS Manual, the work in this solicitation is assigned classification code 234990.

13 SMALL BUSINESS SIZE STANDARD.

This solicitation is not limited to small business concerns, but, for definition purposes, a concern is small if its average annual receipts for its preceding 3 fiscal years did not exceed $28.5 million. (based on FAR 19.102)

(FAR 52.214-3) AMENDMENTS TO INVITATIONS FOR BIDS (DECEMBER 1989).

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.
(b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, (3) by letter or telegram or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids. (FAR 52.214-3.)

15 CHANGES PRIOR TO OPENING BIDS.

The right is reserved, as the interest of the Government may require, to revise the specifications and/or drawings prior to the date set for opening bids. Such revisions will be announced by an amendment or amendments to this Invitation for Bids. **It shall be the responsibility of the prospective bidder to obtain copies of amendments from the website listed in paragraph: PLAN HOLDER'S LIST below**. The Government may (but not required) send an amendment notification to let prospective bidders know that an amendment has been issued. If the revisions and amendments are of a nature which requires material changes in quantities or prices to be bid, the date set for opening bids may be postponed as necessary, in the opinion of the Commander, to enable bidders to revise their bids. In such cases, the amendment will include an announcement of the new date for opening bids.

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

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

(End of provision)

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

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

(End of provision)

18 (EFARS 52.214-5000) 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 the bidder:

(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;

(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.

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

19 AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.

Specifications, standards, and descriptions cited in this solicitation are available as indicated below:

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

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

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

(b) By submitting a request to the—

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

(End of provision)

19.2 CORPS OF ENGINEERS SPECIFICATIONS.

Corps of Engineers specifications of the CRD-C series may be obtained from the National Institute of Building Sciences Construction Criteria Base (CCB) on CD-ROM. Contact the CCB directly at (202) 289-7800 for an order form or

obtain an order form at the following internet address: http://www.ccb.org/ccbsubscribe/Subsmain.asp. There is a regular annual subscription fee to CCB of $700 per year. (Note: This is considered to be the Contractor's responsibility and cost). This will include CCB on CD-ROM or DVD plus unlimited internet access plus access to the new Whole Building Design Guide, now under construction and scheduled for launch in October 2001. Selected Corps of Engineers specifications of CRD-C series are available in Acrobat Reader .pdf file format at the following internet address: http://www.wes.army.mil/SL/MTC/handbook/handbook.htm.

19.3 COMMERCIAL (NON-GOVERNMENT) SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.

These specifications, standards, and descriptions are not available from Government sources. They may be obtained from the publishers.

20 AVAILABLE PLANT.

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.

21 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE.

Whenever a contract or modification of contract price is negotiated, the Contractor's cost proposals for equipment ownership and operating expenses shall be determined in accordance with the requirements of paragraph: EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE, contained in Section: 00800, SPECIAL CONTRACT REQUIREMENTS of the specifications. A copy of EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" is available for review at the office listed in paragraph: SITE VISIT (CONSTRUCTION) herein or at the following internet address: http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep.htm. (copy also included on CD-ROM issued with this solicitation). .

22 NOTICE REGARDING BUY AMERICAN ACT.

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. All bidders are cautioned that, prior Government conduct notwithstanding, the Contractor's selection of a domestic construction material (as defined in FAR 52.225-5 Buy American Act-Construction Materials) which would require the subsequent selection of a foreign construction material for compatibility is not a justification for waiver of the Buy American Act. It is the Contractor's responsibility to

verify, prior to submitting the materials for approval, that each system can be built to meet the contract specifications without the use of foreign construction materials.

23 COLORADO SALES AND USE TAX.

Specific exemption from the Colorado Sales and Use Taxes will be granted by the Colorado Tax authorities with respect to all materials used by a prime Contractor or subcontractor and which are built into structures furnished under contract to a Government agency. The Colorado Sales and Use Taxes shall be excluded from the bid prices. Exemption certificates are available to both Contractors and subcontractors provided personal application is made therefor to the Department of Revenue, State of Colorado, State Capitol Annex, Denver, Colorado. The Contractor or subcontractor will be required to submit the date of the contract, the amount of the contract, and the proposed date for completion of the contract. Telephone: (303) 534-1208 (General Information).

23.1 CITY TAXES.

The Municipality of Denver also has a sales and use tax. The Municipal tax authorities should be contacted by the bidder to determine applicability of the tax to this project.

24 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).

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

(b) Contractors interested in a site visit of the proposed work should contact Bob Faust, Denver Resident Office, 303-367-0316.

25 BIDDER'S QUESTIONS AND COMMENTS.

Questions and/or comments relative to these bidding documents should be submitted via e-mail or mailed to the address identified in paragraph: AVAILABILITY OF BID RESULTS below. Comments should reach this office no later than 20 calendar days prior to the date set for opening of bids, if feasible, in order that changes, if needed, may be added by amendment. E-mail addresses, FAX numbers, items for question and points of contact are listed below. Phone calls with questions should be made between 8:30 a.m. and 3:30 p.m. (Central Standard Time) Monday through Friday.

Note: A courtesy copy of all questions shall be sent to the Contract Specialist (Contractual Matters Point of Contact), the Program Manager and Specifications Section (Technical Content Points of Contact).

Items for Question	Points of Contact/ Phone numbers/ FAX Numbers	E-mail Addresses
Contractual Matters:	Neil Herman	Neil.R.Herman@usace.army.mil
Ordering CD-Rom of	402-221-4119 (phone)	

the plans and specifications (limit One per firm)/ amendments**/ Bid Results (See Paragraph AVAILABILITY OF BID RESULTS, below)/ Receipt of Bids	402-221-4199 (Fax)	
Planholder's List	See paragraph: PLAN HOLDER'S LIST, below.	
Small Business Matters	Hubert Carter 402-221-4110 (phone)	hubert.j.carter@usace.army.mil
Technical Contents Of Plans and Specification	Bob Mattson 402-221-3286 (phone) Or Specifications Section Marylee Stobbe 402-221-4411 (Phone) 402-221-3842 (Fax)	Robert.W.Mattson@usace.army.mil Marylee.F.Stobbe@usace.army.mil
Site Inspection	See Paragraph: SITE VISIT (CONSTRUCTION), above	

**** - The Government may elect to send a notification that an amendment has been posted to the Government's web address. It shall be the Contractor's, Subcontractor's and Supplier's responsibility to check the Government's web address for amendments.**

25.1 PLAN HOLDER'S LIST.

The CD-Rom will provide a list of plan holders that have registered at the time the CD-Rom was created. It is bidder's responsibility to check for any updates to the plan holder's list, which is available at the following web address:

http://ebs-nwo.wes.army.mil/

25.2 AVAILABILITY OF BID RESULTS (Local Clause/Provision)

Bid results will be available after bid opening on the Governent's web address:
http://ebs-nwo.wes.army.mil/. Official bid abstracts will be available and may be requested by sending a self-addressed stamped envelope to: U.S. Army Corps of Engineers, Omaha District, ATTN: CENWO-CT-C(Neil Herman), 106 South 15th Street, Omaha, NE 68102-1618.

26 (FAR 52.233-2) SERVICE OF PROTEST (AUG 1996).

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgement of receipt from District Counsel, 106 South 15th Street, Omaha, Nebraska 68102-1618.

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

27 PRE-AWARD SURVEY INFORMATION (Local Provision) (Sep 93)

In accordance with Paragraph PERFORMANCE AND PAYMENT BONDS, request that the following information be submitted with your bid. This facilitates the award process.

1. Financial
   - Name, address, and fax number of Financial Institution
   - Name and phone number of finance individual (primary and alternate) to be contacted for information

2. Bonding Information
   - Provide the name, address, regular phone number and fax number of your Surety Company.

3. Performance
   - Provide three (3) references to be contacted on your company's performance

   The following information should be submitted:
   Name and Fax number of Owner/User
   Project Name, Location, Contract Number, and dollar value
   Name and phone number of individuals (primary and alternate) that can verify performance of the project

28 (FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

(1) Company name.

(2) Company address.

(3) Company telephone number.

(4) Line of business.

(5) Chief executive officer/key manager.

(6) Date the company was started.

(7) Number of people employed by the company.

(8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet home page at http://www.customerservice@dnb.com. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

(End of provision)

29 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984).

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

30 SUBCONTRACTING PLAN/SUBCONTRACTING GOALS REGARDING THE UTILIZATION OF SMALL BUSINESS CONCERNS.

a. Application. This clause applies only to large business concerns submitting bids for services exceeding $500,000 or for construction exceeding $1,000,000.

b. Federal Acquisition Regulations (FAR). Attention is directed to the following FAR provisions contained in this solicitation:

52.219-8, Utilization of Small Business Concerns (Alternate I)

52.219-9, Small Business Subcontracting Plan (Alternate I)

52.219-16, Liquidated Damages - Small Business Subcontracting Plan

52.226-1, Utilization of Indian Organizations and Indian-Owned Economic Enterprises

c. Goals. The U.S. Army Corps of Engineers considers the following goals reasonable and achievable for fiscal year 2002 and for the performance of the resultant contract:

(1) 57.2% of planned subcontracting dollars with small business concerns.

(2) 8.9% of planned subcontracting dollars with those small business concerns owned and controlled by socially and economically disadvantaged individuals.

(3) 8.1% of planned subcontracting dollars with those small business concerns owned and controlled by women.

(4) 3.0% of planned subcontracting dollars with those small

business concerns owned and controlled by Service-Disabled Veterans.

(5) 3.0% of planned subcontracting dollars with those small business concerns owned and controlled by HubZones.

d. Submission and Review of Subcontracting Plan.

SUBMISSION OF SMALL BUSINESS SUBCONTRACTING PLAN IS NOT APPLICABLE TO SMALL BUSINESSES.

(1) The apparent low bidder must submit a subcontracting plan within five (5) calendar days after bid opening (a longer period maybe granted by the Contracting Officer upon request) within 24 hours after notification by the Government to the Contracting Activity.

(2) Goals included in the subcontracting plan should be at least equal to those indicated above. If lesser goals are proposed, the bidder may be required to substantiate how the proposed plan represents the bidder's best effort to comply with the terms and conditions of the solicitation. Bidders are highly encouraged to become familiar with the intent of the solicitation provisions and the elements of the subcontracting plan.

(3) The subcontracting plan must contain, as a minimum, the elements set forth in FAR provision 52.219-9. An example subcontracting plan will be furnished to the apparent low bidder (upon request). The example subcontracting plan (if requested) should not be construed as an acceptable subcontracting plan. Any format will be acceptable provided that the plan addresses each element as required by the Federal Acquisition Regulations and its supplements.

(4) Proposed plans will be reviewed by the Government to ensure the plan represents the firm's best efforts to maximize subcontracting opportunities for small, small disadvantaged and women-owned businesses.

(5) Subcontracting plans are required to be approved prior to Contract Award. The approved subcontracting plan (to include goals) will become a material part of the contract.

e. Failing to Submit An Acceptable Subcontracting Plan. An apparent low bidder failing to submit a subcontracting plan which demonstrates a reasonable effort to meet the goals listed above or provide an explanation why lesser goals are proposed (upon request), will be considered as non-responsive and not considered eligible for award of the contract.

f. Questions or Assistance Needed in Developing Subcontracting Plan. For any questions or assistance needed in developing the subcontracting plan, contact the Contract Specialist or District's Deputing for Small Business (See paragraph: BIDDER QUESTIONS AND COMMENTS, Contract Specialist [Bid Results] or the District's Deputy for Small Business [Small Business] or fax your inquiries to 402-221-4199).

31 (DFARS 252.204-7004) REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001)

(a) Definitions.

As used in this clause--

(1) “Central Contractor Registration (CCR database” means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) “Data Universal Numbering System (DUNS) number” means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) “Data Universal Numbering System +4 (DUNS+4) number” means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) “Registered in the CCR database” means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at http://www.ccr.gov.

(End of clause)

REQUIRED CENTRAL CONTRACTOR REGISTRATION (CCR)

Register Now: Don't wait until you submit an offer on a solicitation. You must be registered to receive the contract award. It can often take 30 days for CCR to process your registration information.

Register One of Three Ways:

Internet: http://www.ccr.gov

Value Added Network (VAN) for EDI users: Contact your VAN for information. If you need to find a VAN look at http://www.acq.osd.mil/ec/ecip/van_list.htm

FAX or Mail: Call (888)227-2423 or (616)961-4725 to receive a registration package. FAX or mail the completed information to the CCR Assistance Center. It can take up to 30 days to process a faxed or mailed package.

CCR Assistance Center
74 Washington Street North, Suite 7
Battle Creek, MI 49017-3084
FAX: (616)961-7243

SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF BIDDERS

INDEX

1. (FAR 52.203-2) CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985).
2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991).
3. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).
4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) [MAY 1999]
5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).
6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001).
7. (DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding $100,000]
8. (FAR 52.211-6) BRAND NAME OR EQUAL (AUG 1999).
9. RESERVED
10. RESERVED
11. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (APR 2002) ALTERNATE I (APR 2002)
12. (FAR 52.219-2) EQUAL LOW BIDS (OCT 1995)
13. RESERVED
14. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).
15. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).
16. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999)
17. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).
18. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997)
19. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts over $100,000]
20. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (APR 2003)
21. (DFARS 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).

SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF BIDDERS

The bidder (offeror) makes the following certification and representations as a part of the bid, shall check the appropriate boxes, fill in the appropriate information, and provide signatures on the attached "Solicitation Form" (00600) pages, and submit with Standard Form 1442 (Section 00010).

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

(a) The offeror certifies that -

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

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

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

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

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

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

_____

_____

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

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

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

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

2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991).

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

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989, -

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

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

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

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than $10,000, and not more than $100,000, for each such failure.

3. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).

(a) Definitions.

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

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

[ ] TIN: _____.

[ ] TIN has been applied for.

[ ] TIN is not required because:

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

[ ] Offeror is an agency or instrumentality of a foreign government;

[ ] Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

[ ] Sole proprietorship;

[ ] Partnership;

[ ] Corporate entity (not tax-exempt);

[ ] Corporate entity (tax-exempt);

[ ] Government entity (Federal, State, or local);

[ ] Foreign government;

[ ] International organization per 26 CFR 1.6049-4;

[ ] Other _____.

(f) Common parent.

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

[ ] Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) [MAY 1999]

(a) *Definition*. Women-owned business concern, as used in this provision, means a concern that is

at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) *Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219–1, Small Business Program Representations, of this solicitation.]* The offeror represents that it [ ] is a women-owned business concern.
(End of provision)

5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter "CAGE" before the number.

(b) If the offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will-

(1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;

(2) Complete section A and forward the form to DLIS; and

(3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001).

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that—
(i) The Offeror and/or any of its Principals—
(A) Are [ ] are not [ ] presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;
(B) Have [ ] have not [ ], within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and
(C) Are [ ] are not [ ] presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.
(ii) The Offeror has [ ] has not [ ], within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.
(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity *(e.*g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject

to Prosecution Under Section 1001, Title 18, United States Code.

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

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

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

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

7. (DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding $100,000]

(a) Definitions.

As used in this provision-

(1) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A)) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means-

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

(b) Prohibition on award. In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary [or, in the case of a subsidiary, the firm that owns the subsidiary], unless a waiver is granted by the Secretary of Defense.

(c) Disclosure.

The Offeror shall disclose any significant interest the government of each of the following countries has in the Offeror or a subsidiary of the Offeror. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include--

(1) Identification of each government holding a significant interest; and
(2) A description of the significant interest held by each Government.
(End of provision)

8. (FAR 52.211-6) BRAND NAME OR EQUAL (AUG 1999).

(a) If an item in this solicitation is identified as "brand name or equal," the purchase description reflects the characteristics and level of quality that will satisfy the Government's needs. The salient physical, functional, and other characteristics that "equal" products must meet are specified in the solicitation.

(b) To be considered for award, offers of "equal" products, including "equal" products of the brand name manufacturer, must--

(1) Meet the salient physical, functional, and other characteristics specified in the solicitation;

(2) Clearly identify the item by--

(i) Brand name, if any; and

(ii) Make or model number;

(3) Include descriptive literature such as cuts, illustrations, drawings, or a clear reference to previously furnished descriptive data or information available to the Contracting Officer; and

(4) Clearly describe any modifications the offeror plans to make in a product to make it conform to the solicitation requirements. Mark any descriptive material to clearly show the modifications.

(c) The Contracting Officer will evaluate "equal" products on the basis of information by the offeror or identified in the offer and reasonably available to the Contracting Officer. The Contracting Officer is not responsible for locating or securing any information not identified in the offer.

(d) Unless the offeror clearly indicates in its offer that the product being offered is an "equal" product, the offeror shall provide the brand name product referenced in the solicitation.

9. RESERVED

10. RESERVED

11. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (APR 2002) ALTERNATE I (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is _____ [*insert NAICS code*].

(2) The small business size standard is _____ [*insert size standard*].

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) *Representations*. (1) The offeror represents as part of its offer that it [ ] is, [ ] is not a small

business concern.

(2) [*Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents, for general statistical purposes, that it [ ] is, [ ] is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) [*Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents as part of its offer that it [ ] is, [ ] is not a women-owned small business concern.

(4) [*Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents as part of its offer that it [ ] is, [ ] is not a veteran-owned small business concern.

(5) [*Complete only if the offeror represented itself as aveteran-owned small business concern in paragraph (b)(4) of this provision*.] The offeror represents as part of its offer that it [ ] is, [ ] is not a service-disabled veteran-owned small business concern.

(6) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision*.] The offeror represents, as part of its offer, that—

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [*The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:*_____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) [*Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.*] The offeror shall check the category in which its ownership falls:

_____ Black American.
_____ Hispanic American.
_____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).
_____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea),Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).
_____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).
_____ Individual/concern, other than one of the preceding.

(c) *Definitions*. As used in this provision—

"Service-disabled veteran-owned small business concern"—

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service connected, as defined in 38 U.S.C. 101(16).

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

"Veteran-owned small business concern" means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern" means a small business concern—

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice*. (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall—

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

12. (FAR 52.219-2) <u>EQUAL LOW BIDS (OCT 1995)</u>

(a) This provision applies to small business concerns only.

(b) The bidder's status as a labor surplus area (LSA) concern may affect entitlement to award in case of tie bids. If the bidder wishes to be considered for this priority, the bidder must identify, in the following space, the LSA in which the costs to be incurred on account of manufacturing or production (by the bidder or the first-tier subcontractors) amount to more than 50 percent of the contract price.

_____ _____

_____ _____

(c) Failure to identify the labor surplus areas as specified in paragraph (b) of this provision will preclude the bidder from receiving priority consideration. If the bidder is awarded a contract as a result of receiving priority consideration under this provision and would not have otherwise received award, the bidder shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

13. RESERVED

14. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).

(a) *Definition*. "Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the North American Industry Classification System (NAICS) code assigned to a contracting opportunity.

(b) (Complete only if Offeror has represented itself under the provision at FAR 52.219-1 as a small business concern under the size standards of this solicitation.) The Offeror [ ] is, [ ] is not an emerging small business.

(c) (Complete only if the Offeror is a small business or an emerging small business, indicating its size range.)

Offeror's number of employees for the past 12 months (check this column if size standard stated in solicitation is expressed in terms of number of employees) or Offeror's average annual gross revenue for the last 3 fiscal years (check this column if size standard stated in solicitation is expressed in terms of annual receipts). (Check one of the following.)

No. of Employees	Average Annual Gross Revenues
_____50 or fewer	_____$1 million or less
_____51 - 100	_____$1,000,001 - $2 million
_____101 - 250	_____$2,000,001 - $3.5 million
_____251 - 500	_____$3,500,001 - $5 million
_____501 - 750	_____$5,000,001 - $10 million
_____751 - 1,000	_____$10,000,001 - $17 million
_____Over 1,000	_____Over $17 million

15. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).

[Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation.]

Offeror's number of employees for the past 12 months *[check this column if size standard stated in solicitation is expressed in terms of number of employees]* or Offeror's average annual gross revenue for the last 3 fiscal years [check this column if size standard in solicitation is expressed in terms of annual receipts]. *[Check one of the following.]*

No. of Employees	Average Annual Gross Revenues
_____50 or fewer	_____$1 million or less
_____51 - 100	_____$1,000,001 - $2 million
_____101 - 250	_____$2,000,001 - $3.5 million
_____251 - 500	_____$3,500,001 - $5 million
_____501 - 750	_____$5,000,001 - $10 million
_____751 - 1,000	_____$10,000,001 - $17 million
_____Over 1,000	_____Over $17 million

16. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999)

(a) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

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

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

17. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).

The offeror represents that—

(a) It [ ] has, [ ] has not participated in a previous contract or subcontract subject the Equal Opportunity clause of this solicitation;

(b) It [ ] has, [ ] has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

18. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997)

As required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6962(c)(3)(A)(i)), the offeror certifies, by signing this offer, that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by the applicable contract specifications.

(End of provision)

19. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts over $100,000]

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that-

(1) As the owner or operator of a facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file, for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject the Form R filing and reporting requirements because each facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

[ ] (i) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

[ ] (ii) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

[ ] (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

[ ] (iv) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

[ ] (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rica, Guam, American Samoa, the United States Virgin Islands, the Norther Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

20. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (APR 2003)

(a) *Definitions.* As used in this provision-

(1) "Foreign person" means any person (including any individual, partnership, corporation, or other form of association) other than a United States person.

(2) "United States person" is defined in 50 U.S.C. App. 2415(2) and means-

(i) Any United States resident or national (other than an individual resident outside the United States who is employed by other than a United States person);

(ii) Any domestic concern (including any permanent domestic establishment of any foreign concern); and

(iii) Any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern that is controlled in fact by such domestic concern.

(b) *Certification*. If the offeror is a foreign person, the offeror certifies, by submission of an offer, that it-

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. 2407(a) prohibits a United States person from taking.

(End of Provision)

21. (DFARS 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) REPRESENTATION. The Offeror represents that it-

_____ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

_____ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea Clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

SECTION 00700

CONTRACT CLAUSES

INDEX

* - CONTRACT CLAUSES THAT MAY BE INCORPORATED BY REFERENCE

1. FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)
2. DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)
3. *FAR 52.202-1 DEFINITIONS (DEC 2001) ALTERNATE I (MAY 2001)
4. *FAR 52.203-3 GRATUITIES (APR 1984)
5. *FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)
6. *FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)
7. *FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
8. DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE—CONTRACT-RELATED FELONIES (MARCH 1999)
9. DFARS 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991) (For Military Contracts Exceeding $5,000,000)
10. *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
11. *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)
12. *FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)
13. DFARS 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)
14. *FAR 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)
15. DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)
16. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [For Military Contract's Only]
17. FAR 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)
18. *FAR 52.214-26 AUDIT AND RECORDS--SEALED BIDDING (OCT 1997)
19. *FAR 52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA—MODIFICATIONS--SEALED BIDDING (OCT 1997)
20. *FAR 52.214-28 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS—SEALED BIDDING (OCT 1997)
21. *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)
22. *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)
23. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) [When Contracting By Negotiations]
24. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) --ALTERNATE I (OCT 2001) [When Contracting By Sealed Bidding]
25. DFARS 252.219-7009 SECTION 8(a) DIRECT AWARD (MAR 2002) [When Competitive 8(a) Contracting Procedures are used]
26. *FAR 52.219-14 LIMITATIONS ON SUBCONTRACTING (DEC 1996) [For Small Business Set Aside Only]
27. *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

28. DFARS 252.219-7010 ALTERNATE A (JUN 1998) [When Competitive 8(a) Contracting Procedures are used]
29. FAR 52.219-18 NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(A) CONCERNS (JUNE 1999) [When Competitive 8(a) Contracting Procedures are used]
30. DFARS 252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR 1996)
31. DFARS 252.219-7004 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUN 1997)
32. *FAR 52.222-3 CONVICT LABOR (AUG 1996)
33. *FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT—OVERTIME COMPENSATION (SEPT 2000)
34. *FAR 52.222-6 DAVIS-BACON ACT (FEB 1995)
35. *FAR 52.222-7 WITHHOLDING OF FUNDS (FEB 1988)
36. *FAR 52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)
37. *FAR 52.222-9 APPRENTICES AND TRAINEES (FEB 1988)
38. *FAR 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)
39. *FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)
40. *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)
41. *FAR 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
42. *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
43. *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)
44. *FAR 52.222-26 EQUAL OPPORTUNITY (APR 2002)
45. *FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)
46. *FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)
47. *FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)
48. *FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)
49. *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)
50. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998) [For Work on Federal Facilities]
51. *FAR 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)
52. FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (AUG 2000) [For Contracts exceeding $100,000. EPA Designated product (available at http://www.epa.gov/cpg/)]
53. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts Over $100,000]
54. RESERVED
55. DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)
56. *FAR 52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (MAY 2002) (For Contracts less than $6.481 million)
57. *FAR 52.225-10 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS (MAY 2002) (Applicable with FAR 52.225-9)
58. *FAR 52.225-11 BUY AMERICAN ACT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JULY 2002) [For Contracts more than $6,481,000] ALTERNATE I (MAY 2002) [For Contracts between $6.481 and 7.304733 Million]
59. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2002) [Applicable with FAR 52.225-11] ALTERNATE II (MAY 2002) [For Contracts Between 6.481 and 7.344733 Million]
60. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JULY 2000)

61. *FAR 52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES (JUNE 2000)
62. *FAR 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)
63. *FAR 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)
64. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)
65. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)
66. FAR 52.228-1 BID GUARANTEE (SEP 1996) [NOTE: Not required for projects less than $100,000]
67. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)
68. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [For Contracts Exceeding $100,000]
69. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)
70. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)
71. FAR 52.228-13 ALTERNATIVE PAYMENT PROTECTIONS (JULY 2000) [Applicable only for projects or delivery orders less than $100,000]
72. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)
73. FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS (JULY 2000).
74. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (APR 2003) [For Contracts Exceeding $100,000]
75. RESERVED
76. DFARS 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)
77. *FAR 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (SEPT 2002)
78. RESERVED.
79. *FAR 52.232-17 INTEREST (JUN 1996)
80. *FAR 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)
81. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (FEB 2002)
82. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)
83. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)
84. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)
85. *FAR 52.233-1 DISPUTES (JULY 2002)
86. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)
87. RESERVED
88. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)
89. *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)
90. *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)
91. RESERVED
92. *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)
93. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)
94. *FAR 52.236-8 OTHER CONTRACTS (APR 1984)
95. *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)
96. *FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)
97. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)
98. *FAR 52.236-12 CLEANING UP (APR 1984)
99. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)
100. *FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)
101. FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)
102. *FAR 52.236-17 LAYOUT OF WORK (APR 1984)
103. FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)
104. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)
105. DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)
106. DFARS 252.236-7008 CONTRACT PRICES - BIDDING SCHEDULES (DEC 1991)

107. *FAR 52.242-13 BANKRUPTCY (JUL 1995)
108. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)
109. FAR 52.243-4 CHANGES (AUG 1987)
110. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)
111. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)
112. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)
113. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2002)
114. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [For Government Property over $100,000]
115. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984) [For Government Property $100,000 or Less]
116. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)
117. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)
118. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)
119. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)
120. FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) (ALERNATE I (APR 1984)
121. *FAR 52.249-1 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM) (APR 1984) [For Contracts $100,000 or Less]
122. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) ALTERNATE I (SEP 1996) [For Contracts Over $100,000]
123. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)
124. ENVIRONMENTAL LITIGATION (1974 NOV OCE)
125. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS
126. INAPPLICABLE PROVISIONS AND CLAUSES (Local Provision). [Applicable only for projects or delivery orders less than $100,000]

SECTION 00700

CONTRACT CLAUSES

1. FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://www.arnet.gov/far

(End of clause)

* - CONTRACT CLAUSES THAT MAY BE INCORPORATED BY REFERENCE

2. DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) Definition.

"Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

3. *FAR 52.202-1 DEFINITIONS (DEC 2001) ALTERNATE I (MAY 2001)

a) “Agency head” or “head of the agency” means the Secretary (Attorney General, Administrator, Governor, Chairperson, or other chief official, as appropriate) of the agency, unless otherwise indicated, including any deputy or assistant chief official of the executive agency.

(b) “Commercial component” means any component that is a commercial item.

(c) “Commercial item” means—

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and that—

(i) Has been sold, leased, or licensed to the general public; or

(ii) Has been offered for sale, lease, or license to the general public;

(2) Any item that evolved from an item described in paragraph (c)(1) of this clause through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

(3) Any item that would satisfy a criterion expressed in paragraphs (c)(1) or (c)(2) of this clause, but for—

(i) Modifications of a type customarily available in the commercial marketplace; or

(ii) Minor modifications of a type not customarily available in the commercial marketplace made to meet Federal Government requirements. “Minor” modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or

change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

(4) Any combination of items meeting the requirements of paragraphs (c)(1), (2), (3), or (5) of this clause that are of a type customarily combined and sold in combination to the general public;

(5) Installation services, maintenance services, repair services, training services, and other services if—

(i) Such services are procured for support of an item referred to in paragraph (c)(1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government

(6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed. For purposes of these services—

(i) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) "Market prices" means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

(7) Any item, combination of items, or service referred to in paragraphs (c)(1) through (c)(6), notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a Contractor; or

(8) A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local Governments.

(d) "Component" means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) "Contracting Officer" means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) "Nondevelopmental item" means—

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(End of clause)

4. *FAR 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

(2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

(b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.

(c) If this contract is terminated under paragraph (a) above, the Government is entitled--

(1) To pursue the same remedies as in a breach of the contract; and

(2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)

(d) 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.

5. *FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. 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 the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

6. *FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)

(a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract. "Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a

subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from--

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.

(c) (1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may

(i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or

(ii) direct that the Prime Contractor withhold from sums owed a subcontractor under the prime contract the amount of the kickback. The Contracting Officer may order that monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed $100,000.

7. *FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) If the Government receives information that a contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by section 4304 of the National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106), the Government may--

(1) Cancel the solicitation, if the contract has not yet been awarded or issued; or

(2) Rescind the contract with respect to which--

(i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either--

(A) Exchanging the information covered by such subsections for anything of value; or

(B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or

(ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsection 27(e)(1) of the Act.

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

8. DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE—CONTRACT-RELATED FELONIES (MARCH 1999)

(a) Definitions.

As used in this clause--

(1) "Arising out of a contract with the "DoD" means any any act in connection with--

(i) Attempting to obtain;

(ii) Obtaining; or

(iii) Performing a contract or first-tier subcontract of any department, or component of the Department of Defense (DoD).

(2) "Conviction of fraud or any other felony," means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of nolo contendere, for which sentence has been imposed.

(3) "Date of conviction," means the date judgement was entered against the individual.

(b) Any individual who is convicted after September 29, 1988 of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--

(1) In a management or supervisory capacity on any DoD contract or first-tier subcontract;

(2) On board of directors of any DoD Contractor or first-tier subcontractor;

(3) As a consultant to any DoD Contractor or first-tier subcontractor; or

(4) In any other capacity with the authority to influence, advise, or control the decisions of any DoD contractor or subcontractor with regard to any DoD contract or first-tier subcontract.

(c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than five years from the date of conviction.

(d) 10 U.S.C. 2408 provides that a defense Contractor or first-tier subcontractor shall be subject to a criminal penalty of not more than $500,000 if convicted of knowingly--

(1) Employing a person under a prohibition in paragraph (b) of this clause;

(2) Allowing such a person to serve on the board of directors of Contractor or first-tier subcontractor.

(e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as--

(1) Suspension or debarment;

(2) Cancellation of the contract at no cost to the Government; or

(3) Termination of the contract for default.

(f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify--

(1) The person involved;

(2) The nature of the conviction and resultant sentence or punishment imposed;

(3) The reasons for the requested waiver; and

(4) An explanation of why a waiver is in the interest of national security.

(g) The Contractor agrees to include the substance of this clause appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.

(h) Pursuant to 10 U.S.C.2408(c), defense contractors and subcontractors may obtain information as to whether a particular has been convicted of fraud or any other felony arising out of a contract with the DoD by contracting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (202) 616-3507.

9. DFARS 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991) (<u>For Military Contracts Exceeding $5,000,000</u>)

(a) The Contractor shall display prominently in common work areas within business segments performing work under Department of Defense (DoD) contracts, DoD Hotline Posters prepared by DoD Office of the Inspector General.

(b) DoD Hotline Posters may be obtained from the DoD Inspector General, ATTN: Defense Hotline, 400 Army Navy Drive, Washington DC 22202-2884.

(c) The Contract need not comply with paragraph (a) of this clause if it has established a mechanism, such as a hotline, by which employees may report suspected instances of improper conduct, and instructions that encourage employees to make such reports.

10. *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of subsection 27(a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

11. *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)

(a) Definitions.

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

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

(1) The awarding of any Federal contract.

(2) The making of any Federal grant.

(3) The making of any Federal loan.

(4) The entering into of any cooperative agreement.

(5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

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

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

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

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

(1) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.

(2) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.

(3) A special Government employee, as defined in section 202, title 18, United States Code.

(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

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

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

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

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

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

(b) Prohibitions.

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

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

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

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

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

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

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

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

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

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

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

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

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

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

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or

negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

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

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

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

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

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

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

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

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

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

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

(v) Penalties.

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

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

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

12. *FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause—

"Postconsumer material" means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material." For paper and paper products, postconsumer material means "postconsumer fiber" defined by the U.S. Environmental Protection Agency (EPA) as—

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

"Printed or copied double-sided" means printing or reproducing a document so that information is on both sides of a sheet of paper.

"Recovered material," for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as "recovered fiber" and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as—

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

13. DFARS 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the Contractor.

14. *FAR 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

(a) The Government suspends or debars Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of $25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.

(b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed $25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principals, is or is not debarred, suspended, or proposed for debarment by the Federal Government.

(c) A corporate office or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Procurement Programs). The notice must include the following:

(1) The name of the subcontractor.

(2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Procurement Programs.

(3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Procurement Programs.

(4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.

15. DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of $25,000 with a firm, or a subsidiary of a firm, that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country. The notice must include the name of the proposed subcontractor and the compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

(End of clause)

16. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [<u>For Military Contract's Only</u>]

This is a rated order certified for national defense use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).

17. FAR 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

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

Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.

18. *FAR 52.214-26 AUDIT AND RECORDS--SEALED BIDDING (OCT 1997)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Cost or pricing data. If the Contractor has submitted cost or pricing data in connection with the pricing of any modification to this contract, the Contracting Officer or authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections related to--

(1) The proposal for the modification;

(2) The discussions conducted on the proposal(s), including those related to negotiating;

(3) Pricing of the modification; or

(4 Performance of the modification.

(c) Comptroller General. In the case of pricing any modification, the Comptroller General of the United States, or an authorized representative, shall have the same rights as specified in paragraph (b) of this clause.

(d) Availability. The Contractor shall make available at its office at all reasonable times the materials described in paragraph (b) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract, or for any other period specified in Subpart 4.7 of the Federal Acquisition Regulation (FAR). FAR Subpart 4.7, Contractor Records Retention, in effect on the date of this contract, is incorporated by reference in its entirety and made a part of this contract.

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement.

(2) Records pertaining to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to the performance of this contract shall be made available until disposition of such appeals, litigation, or claims.

(e) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (e), in all subcontracts expected to exceed the threshold in FAR 15.403-4(a)(1) for submission of cost or pricing data.

19. *FAR 52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA—MODIFICATIONS--SEALED BIDDING (OCT 1997)

(a) This clause shall become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), except that this clause does not apply to any modification if an exception under FAR 15.403-1(b) applies.

(b) If any price, including profit, negotiated in connection with any modification under this clause, was increased by any significant amount because

(1) The Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data,

(2) a subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data, or

(3) Any of these parties furnished data of any description that were not accurate, the price shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) of this clause.

(c) Any reduction in the contract price under paragraph (b) above due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which

(1) the actual subcontract or

(2) the actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(d) (1) If the Contracting Officer determines under paragraph (b) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.

(ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2) (i) Except as prohibited by subdivision (d)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the date of agreement on the price of the contract (or price of the modification) and that the data were not submitted before such date.

(ii) An offset shall not be allowed if--

(A) The understated data was known by the Contractor to be understated when the Certificate of Current Cost or Pricing Data was signed; or

(B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the date of agreement on price.

(e) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

(2) A penalty equal to the amount of the overpayment, if the Contractor of subcontractor knowingly submitted cost or pricing data which were incomplete, inaccurate, or noncurrent.

20. *FAR 52.214-28 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS—SEALED BIDDING (OCT 1997)

(a) The requirements of paragraphs (b) and (c) of this clause shall--

(1) Become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1); and

(2) Be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1(b) applies.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR subsection 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (b) above were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that when entered into, exceeds the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1).

(End of clause)

21. *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)

(a) *Definition*. "HUBZone small business concern," as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) *Evaluation preference*. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except—

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer. These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) *Waiver of evaluation preference*. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

[ ] Offeror elects to waive the evaluation preference.

(d) *Agreement*. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for—

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone

small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

22. *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. 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) *Definitions*. As used in this contract—

“HUBZone small business concern” means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration .

“Service-disabled veteran-owned small business concern ” —

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern” means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

“Small disadvantaged business concern” means a small business concern that represents, as part of its offer that—

(1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, Subpart B;

(2) No material change in disadvantaged ownership and control has occurred since its certification;

(3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

"Veteran-owned small business concern" means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern" means a small business concern—

(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

(End of clause)

23. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) [<u>When Contracting By Negotiations</u>]

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

(b) *Definitions*. As used in this clause—

"Commercial item" means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

"Commercial plan" means a subcontracting plan (including goals) that covers the offeror's fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

"Individual contract plan" means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

"Master plan" means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

"Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. The offeror shall include all subcontracts that contribute to contract performance, and may

include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRONet as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of $500,000 ($1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than $100,000, indicating—

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small 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, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business 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.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business , HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

(1) The master plan has been approved;

(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

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

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts.* This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report.* This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

24. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) --ALTERNATE I (OCT 2001) [<u>When Contracting By Sealed Bidding</u>]

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

(b) *Definitions*. As used in this clause—

"Commercial item" means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

"Commercial plan" means a subcontracting plan (including goals) that covers the offeror's fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

"Individual contract plan" means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

"Master plan" means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

"Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The apparent low bidder, upon request by the Contracting Officer, shall submit a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns. If the bidder is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be submitted within the time specified by the Contracting Officer. Failure to submit the subcontracting plan shall make the bidder ineligible for the award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor

Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRONet as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of $500,000 ($1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than $100,000, indicating—

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not,

why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small 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, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business 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.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business , HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

(1) The master plan has been approved;

(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is

supplying a commercial item.

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

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts.* This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report.* This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

25. DFARS 252.219-7009 SECTION 8(a) DIRECT AWARD (MAR 2002) [<u>When Competitive 8(a) Contracting Procedures are used</u>]

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Partnership Agreement dated February 1, 2002, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA, even if not identified in Section A of this contract, is the prime contractor and retains responsibility for 8(a) certification, for 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA district office is:

[To be completed by the Contracting Officer at the time of award]

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract. The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assign contract administration functions to a contract administration office.

(c) The 8(a) Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 13 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L. 100-656, transfer of

ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

(End of clause)

26. *FAR 52.219-14 LIMITATIONS ON SUBCONTRACTING (DEC 1996) [<u>For Small Business Set Aside Only</u>]

(a) This clause does not apply to the unrestricted portion of a partial set-aside.

(b) By submission of an offer and execution of a contract, the Offeror/Contractor agrees that in performance of the contract in the case of a contract for--

(1) Services (except construction). At least 50 percent of the cost of contract performance incurred for personnel shall be expended for employees of the concern.

(2) Supplies (other than procurement from a nonmanufacturer of such supplies). The concern shall perform work for at least 50 percent of the cost of manufacturing the supplies, not including the cost of materials.

(3) General construction. The concern will perform at least 15 percent of the cost of the contract, not including the cost of materials, with its own employees.

(4) Construction by special trade contractors. The concern will perform at lest 25 percent of the cost of the contract, not including the cost of materials, with its own employees.

27. *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

(a) Failure to make a good faith effort to comply with the subcontracting plan, as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled ``Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan., If, at contract completion, or in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled ``Small Business Subcontracting Plan," the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by a commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled, Disputes, from many final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

28. DFARS 252.219-7010 ALTERNATE A (JUN 1998) [When Competitive 8(a) Contracting Procedures are used]

As prescribed in 219.811-3(2), substitute the following paragraph (c) for paragraph (c) of the clause at FAR 52.219-18:

(c) Any award resulting from this solicitation will be made directly by the Contracting Officer to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

29. FAR 52.219-18 NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(A) CONCERNS (JUNE 1999) [When Competitive 8(a) Contracting Procedures are used]

(a) Offers are solicited only from small business concerns expressly certified by the Small Business Administration (SBA) for participation in the SBA's 8(a) Program and which meet the following criteria at the time of submission of offer--

(1) The Offeror is in conformance with the 8(a) support limitation set forth in its approved business plan; and

(2) The Offeror is in conformance with the Business Activity Targets set forth in its approved business plan or any remedial action directed by the SBA.

(b) By submission of its offer, the Offeror represents that it meets all of the criteria set forth in paragraph (a) of this clause.

(c) Any award resulting from this solicitation will be made to the Small Business Administration, which will subcontract performance to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

(d) (1) Agreement. A small business concern submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States. The term ``United States'' includes its territories and possessions, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia. If this procurement is processed under simplified acquisition procedures and the total amount of this contract does not exceed $25,000, a small business concern may furnish the product of any domestic firm. This subparagraph does not apply in connection with construction or service contracts.

(2) The . . . . . [insert name of SBA's contractor] will notify the U.S. Army Corps of Engineers Contracting Officer in writing immediately upon entering an agreement (either oral or written) to transfer all or part of its stock or other ownership interest to any other party.

(End of clause)

30. DFARS 252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR 1996)

This clause supplements the Federal Acquisition Regulation 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan, clause of this contract.

(a) Definitions.

"Historically black colleges and universities," as used in this clause, means institutions determined by the Secretary of Education to meet the requirements of 34 CFR Section 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority institutions," as used in this clause, means institutions meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)). The term also includes Hispanic-serving institutions as defined in Section 316(b)(1) of such Act (20 U.S.C. 1059c(b)(1).

(b) Except for company or division-wide commercial products subcontracting plans, the term "small disadvantaged business," when used in the FAR 52.219-9 clause, includes historically black colleges and universities and minority institutions in addition to small disadvantaged business concerns.

(c) Work under the contract or its subcontracts shall be credited toward meeting the small disadvantaged business concern goal required by paragraph (d) of the FAR 52.219-9 clause when:

(1) It is performed on Indian lands or in joint venture with an Indian tribe or a tribally-owned corporation, and

(2) It meets the requirements of 10 U.S.C. 2323a.

(d) Subcontracts awarded to workshops approved by the Committee for Purchase from People Who are Blind or Severely Disabled (41 U.S.C. 46-48), may be counted toward the Contractor's small business subcontracting goal.

(e) A mentor firm, under the Pilot Mentor-Protege Program established under Section 831 of Pub. L. 101-510, as amended, may count toward its small disadvantaged business goal, subcontracts awarded--

(1) Protege firms which are qualified organizations employing the severely handicapped; and

(2) Former protege firms that meet the criteria in Section 831(g)(4) of Pub. L. 101-510.

(f) The master plan approval referred to in paragraph (f) of the FAR 52.219-9 clause is approval by the Contractor's cognizant contract administration activity.

(g) In those subcontracting plans which specifically identify small, small disadvantaged, and women-owned businesses, the Contractor shall notify the Administrative Contracting Officer of any substitutions of firms that are not small, small disadvantaged, or women-owned small businesses for the firms listed in the subcontracting plan. Notifications shall be in writing and shall occur within a reasonable period of time after award of the subcontract. Contractor-specified formats shall be acceptable.

31. DFARS 252.219-7004 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUN 1997)

(a) Definition. "Subcontract," as used in this clause, means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(b) The Offeror's comprehensive small business subcontracting plan and its successors, which are authorized by and approved under the test program of Section 834 of Pub. L. 101-189, shall be included in and made a part of the resultant contract. Upon expulsion from the test program or expiration of the test program, the Contractor shall negotiate an individual subcontracting plan for all future contracts that meet the requirements of Section 211 of Publ. L. 95-507.

(c) The Contractor shall submit Standard Form 295, Summary Subcontract Report, in accordance with the instructions on the form, except--

(1) One copy of SF 295 and attachments shall be submitted to Director, Small and Disadvantaged Business Utilization, Office of the Deputy Under Secretary of Defense (International and Commercial Programs), 3061 Defense Pentagon, Room 2A338, Washington, DC 20301-3061; and

(2) Item 14, Remarks, shall be completed to include semi-annual cumulative--

(1) Small business, small disadvantaged business and women-owned small business goals; and

(2) Small business and small disadvantaged business goals, actual accomplishments, and percentages for each of the two designated industry categories.

(d) The failure of the Contractor or subcontractor to comply in good faith with (1) the clause of this contract entitled "Utilization of Small, Small Disadvantaged and Women-Owned Small Business Concerns," or (2) an approved plan required by this clause, shall be a material breach of the contract.

32. *FAR 52.222-3 CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if--

(a) (1) The worker is paid or is in an approved work training program on a voluntary basis;

(2) Representatives of local union central bodies or similar labor union organizations have been consulted;

(3) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services; and

(4) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and

(b) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

33. *FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT—OVERTIME COMPENSATION (SEPT 2000)

(a) *Overtime requirements*. No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) *Violation; liability for unpaid wages; liquidated damages*. The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of $10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) *Withholding for unpaid wages and liquidated damages*. The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) *Payrolls and basic records*. (1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act .

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) *Subcontracts*. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this

clause in subcontracts exceeding $100,000 and require subcontractors to include these provisions in any lower-tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.
(End of clause)

34. *FAR 52.222-6 DAVIS-BACON ACT (FEB 1995)

(a) All laborers and mechanics employed or working upon the site of the work will 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 regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination 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 and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (d) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(b) (1) The Contracting Officer shall require that any class of laborers or mechanics, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the construction industry.

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the Contractor and laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (b)(2) and (b)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(d) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

35. *FAR 52.222-7 WITHHOLDING OF FUNDS (FEB 1988)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, 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 Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

36. *FAR 52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)

(a) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Davis-Bacon Act, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b) (1) The Contractor shall submit weekly for each week in which any contract work is performed a coy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify--

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate,

either directly or indirectly, and that no deductions have been made either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor of subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

37. *FAR 52.222-9 APPRENTICES AND TRAINEES (FEB 1988)

(a) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to 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 or her first 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 on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will not longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless 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. The ratio of trainees to journeymen on the job site shall not be greater

than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will 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) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be inconformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

38. *FAR 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

39. *FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Withholding of Funds, Subcontracts (Labor Standards), Contract Termination--Debarment, Disputes Concerning Labor Standards, Compliance with Davis-Bacon and Related Act Regulations ,and Certification of Eligibility, and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b) (1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

40. *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)

A breach of the contract clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Davis-Bacon and Related Act Regulations, or Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

41. *FAR 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

42. *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency the U.S. Department of Labor, or the employees of their representatives.

43. *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)

(a) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

44. *FAR 52.222-26 EQUAL OPPORTUNITY (APR 2002)

(a) *Definition*. "United States," as used in this clause, means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of $10,000, the Contractor shall comply with paragraphs (b)(1) through (b)(11) of this clause, except for work performed outside the United States by employees who were not recruited within the United States. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall 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. This shall include, but not be limited to—

(i) Employment;
(ii) Upgrading;
(iii) Demotion;
(iv) Transfer;
(v) Recruitment or recruitment advertising;
(vi) Layoff or termination;
(vii) Rates of pay or other forms of compensation; and
(viii) Selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, 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.

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

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of paragraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the Contracting Officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance, provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

(End of clause)

45. *FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions.

"Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly Federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) 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).

(2) 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);

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

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade each such subcontract in excess of $10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative actin obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity 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 Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that 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 in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, 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 affirmative action 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 implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite 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 these sites or facilities.

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

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority 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 that 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 subparagraph (g)(2) of this clause.

(6) Disseminate the Contractor's equal employment policy by--

(i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;

(ii) Including the policy in any policy manual and in collective bargaining agreements;

(iii) Publicizing the policy in the company newspaper, annual report, etc.;

(iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and

(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a 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 equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct 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 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, 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 minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

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

(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 Contractor's obligations under this contract 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) Maintain a record of solicitations for subcontracts for 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 lest annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;

(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply 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 shall be established. The Contractor 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 nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use 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 under Executive Order 11246, as amended.

(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 under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those 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 Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, 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, separate records are not required to be maintained.

(o) Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the 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).

46. *FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) *Definitions*. As used in this clause—

"All employment openings" means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

"Executive and top management" means any employee—

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

"Other eligible veteran" means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

"Positions that will be filled from within the Contractor's organization" means employment openings for which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly established "recall" lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

"Qualified special disabled veteran" means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

"Special disabled veteran" means—

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability—

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (*i.e.*, a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

"Veteran of the Vietnam era" means a person who—

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.

(b) *General*. (1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as—

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by

the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) *Listing openings*. (1) The Contractor shall immediately list all employment openings that 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 where the contract is being performed, but excluding those of independently operated corporate affiliates, at an appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency 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 terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) *Applicability*. This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) *Postings*. (1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall—

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall 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 special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) *Noncompliance*. If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) *Subcontracts*. The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for

noncompliance.
(End of clause)

47. *FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General.

(1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;

(iii) Rates of pay or other forms of compensation and changes in compensation;

(iv) Job assignments, job classifications, orgizational structures, position descriptions, lines of progression, and senority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor, including social or recreational programs; and

(ix) Any other term, condition, or priviledge of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings.

(1) The Contractor agrees to post employment notices stating--

(i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and

(ii) The rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.

(3) The Contractor shall 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 Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.

(c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(d) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of $10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

48. *FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on—

(1) The number of special disabled veterans, the number of veterans of the Vietnam era, and other eligible veterans in the workforce of the Contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of the total, the number of special disabled veterans, the number of veterans of the Vietnam era, and the number of other eligible veterans; and

(3) The maximum number and the minimum number of employees of the Contractor during the period covered by the report.

(b) The Contractor shall report the above items by completing the Form VETS-100, entitled "Federal Contractor Veterans' Employment Report (VETS-100 Report)".

(c) The Contractor shall submit VETS-100 Reports no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date—

(1) As of the end of any pay period between July 1 andAugust 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior writtenapproval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The Contractor shall base the count of veterans reported according to paragraph (a) of this clause on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all special disabled veterans, veterans of the Vietnam era, and other eligible veterans who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that—

(1) The information is voluntarily provided;

(2) The information will be kept confidential;

(3) Disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and

(4) The information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

(End of clause)

49. *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (*i.e.*, if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans), it has submitted the most recent VETS-100 Report required by that clause.

(End of provision)

50. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998) [<u>For Work on Federal Facilities</u>]

(a) Executive Order 12856 of August 3, 1993, requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

51. *FAR 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)

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

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

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

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

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

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

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

(b) The Contractor, if other than an individual, shall--within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

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

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

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

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

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

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

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

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

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

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

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

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

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

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.560, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

52. FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (AUG 2000) [For Contracts exceeding $100,000. EPA Designated product (available at http://www.epa.gov/cpg/)]

(a) Definitions. As used in this clause—

"Postconsumer material" means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material."

"Recovered material" means waste materials and by-products recovered or diverted from solid waste, but the term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

(b) The Contractor, on completion of this contract, shall—

(1) Estimate the percentage of the total recovered material used in contract performance, including, if applicable, the percentage of postconsumer material content; and

(2) Submit this estimate to the Contracting Officer.

(End of clause)

53. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts Over $100,000]

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor owned or operated facility use in the performance of this contract is exempt from the requirement to file an annual Form R if--

(1) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

(3) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

(4) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

(5) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rica, Guam, American Samoa, the United States Virgin Islands, the Norther Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any one of its owned or operated facilities used in the performance of this contract is no longer exempt-

(1) The Contractor shall notify the Contracting Officer;

and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract is no longer exempt, shall (i) submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and (ii) continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items, as defined in FAR Part 2, the Contractor shall-

(1) For competitive subcontracts expected to exceed $100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding $100,000 (including all options), the substance of this clause, except this paragraph (e).

54. RESERVED

55. DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)

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

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR Part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non-DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

56. *FAR 52.225-9 BUY AMERICAN ACT—CONSTRUCTION MATERIALS (MAY 2002) (<u>For Contracts less than $6.481 million</u>)

(a) *Definitions*. As used in this clause—

"Component" means an article, material, or supply incorporated directly into a construction material.

"Construction material" means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

"Cost of components" means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

"Domestic construction material" means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

"Foreign construction material" means a construction material other than a domestic construction material.

"United States" means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Domestic preference*. (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows:

_____

[*Contracting Officer to list applicable excepted materials or indicate "none"*]

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the BuyAmerican Act*. (1)(i) Any Contractor request to

use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;
(B) Unit of measure;
(C) Quantity;
(D) Price;
(E) Time of delivery or availability;
(F) Location of the construction project;
(G) Name and address of the proposed supplier; and
(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) *Data*. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
Item 1:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
Item 2:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List *name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]*
[Include other applicable supporting information.]
[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

57. *FAR 52.225-10 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS (MAY 2002) (Applicable with FAR 52.225-9)

(a) *Definitions*. "Construction material," "domestic construction material," and "foreign construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act—Construction Materials" (Federal Acquisition Regulation (FAR) clause 52.225-9).

(b) *Requests for determinations of inapplicability*. An offeror requesting a determination regarding the

inapplicability of the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers*. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act, based on claimed unreasonable cost of domestic construction material, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(3)(i) of the clause at FAR 52.225-9.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers*. (1) When an offer includes foreign construction material not listed by the Government in this solicitation in paragraph (b)(2) of the clause at FAR 52.225-9, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-9 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-9 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested—

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

58. *FAR 52.225-11 BUY AMERICAN ACT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (JULY 2002) [For Contracts more than $6,481,000] ALTERNATE I (MAY 2002) [For Contracts between $6.481 and 7.304733 Million]

(a) *Definitions*. As used in this clause—

"Component" means an article, material, or supply incorporated directly into a construction material.

"Construction material" means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

"Cost of components" means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For componentsmanufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

"Designated country" means any of the following countries:

Aruba	Kiribati
Austria	Korea, Republic of

Bangladesh	Lesotho
Belgium	Liechtenstein
Benin	Luxembourg
Bhutan	Malawi
Botswana	Maldives
Burkina Faso	Mali
Burundi	Mozambique
Canada	Nepal
Cape Verde	Netherlands
Central African Republic	Niger
Chad	Norway
Comoros	Portugal
Denmark	Rwanda
Djibouti	Sao Tome and Principe
Equatorial Guinea	Sierra Leone
Finland	Singapore
France	Somalia
Gambia	Spain
Germany	Sweden
Greece	Switzerland
Guinea	Tanzania U.R.
Guinea-Bissau	Togo
Haiti	Tuvalu
Hong Kong	Uganda
Iceland	United Kingdom
Ireland	Vanuatu
Israel	Western Samoa
Italy	Yemen
Japan	

"Designated country construction material" means a construction material that—

(1) Is wholly the growth, product, or manufacture of a designated country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different construction material distinct from the materials from which it was transformed.

"Domestic construction material" means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

"Foreign construction material" means a construction material other than a domestic construction material.

"North American Free Trade Agreement country" means Canada or Mexico.

"North American Free Trade Agreement country construction material" means a construction material that—

(1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a NAFTA country into a new and different construction material distinct from the materials from which it was transformed.

"United States" means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Construction materials*. (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) by

providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act and the North American Free Trade Agreement (NAFTA) apply to this acquisition. Therefore, the Buy American Act restrictions are waived for designated country and NAFTA country construction materials.

(2) The Contractor shall use only domestic, designated country, or NAFTA country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to the construction materials or components listed by the Government as follows:

_____

[*Contracting Officer to list applicable excepted materials or indicate "none"*]

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act*. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) *Data*. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
Item 1:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
Item 2:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List *name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.] [Include other applicable supporting information.]*
[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

(End of clause)

Alternate I (May 2002). As prescribed in 25.1102(c)(3), delete the definitions of "North American Free Trade Agreement country" and "North American Free Trade Agreement country construction material" from the definitions in paragraph (a) of the basic clause and substitute the following paragraphs (b)(1) and (b)(2) for paragraphs (b)(1) and (b)(2) of the basic clause:

(b) *Construction materials*. (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act applies to this acquisition. Therefore, the Buy American Act restrictions are waived for designated country construction materials.

(2) The Contractor shall use only domestic or designated country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

59. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2002) [Applicable with FAR 52.225-11] ALTERNATE II (MAY 2002) [For Contracts Between 6.481 and 7.344733 Million]

(a) *Definitions.* "Construction material," "designated country construction material," "domestic construction material," "foreign construction material," and "NAFTA country construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act—Construction Materials under Trade Agreements" (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) *Requests for determination of inapplicability*. An offeror requesting a determination regarding the inapplicability of the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers*. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers*. (1) When an offer includes foreign construction material, other than designated country or NAFTA country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic,

designated country, or NAFTA country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or NAFTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or NAFTA country construction material. An offer based on use of the foreign construction material for which an exception was requested—

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

ALTERNATE II (MAY 2002) **[For Contracts between 6.481 and 7.304733 Million]**
As prescribed in 25.1102(d)(3), substitute the following paragraphs (a) and (d) for paragraphs (a) and (d) of the basic provision:

(a) *Definitions*. "Construction material," "designated country construction material," "domestic construction material," and "foreign construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act—Construction Materials under Trade Agreements" (Federal Acquisition Regulation (FAR) clause 52.225-11).

(d) *Alternate offers*. (1) When an offer includes foreign construction material, other than designated country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic or designated country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic or designated country construction material, and the offeror shall be required to furnish such domestic or designated country construction material. An offer based on use of the foreign construction material for which an exception was requested—

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

60. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JULY 2000)

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban , and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

(End of clause)

61. *FAR 52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES (JUNE 2000)

(a) Definitions. As used in this clause:

"Indian" means any person who is a member of any Indian tribe, band, group, pueblo, or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c) and any "Native" as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601).

"Indian organization" means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C., chapter 17.

"Indian-owned economic enterprise" means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitutes not less than 51 percent of the enterprise.

"Indian tribe" means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1452(c).

"Interested party" means a prime contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

(b) The Contractor shall use its best efforts to give Indian organizations and Indian-owned economic enterprises (25 U.S.C. 1544) the maximum practicable opportunity to participate in the subcontracts it awards to the fullest extent consistent with efficient performance of its contract.

(1) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization or Indian-owned economic enterprise as to its eligibility, unless an interested party challenges its status or the Contracting Officer has independent reason to question that status. In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to the—

U.S. Department of the Interior
Bureau of Indian Affairs (BIA)
Attn: Chief, Division of Contracting and
Grants Administration
1849 C Street, NW,
MS-2626-MIB
Washington, DC 20240-4000.

The BIA will determine the eligibility and notify the Contracting Officer. No incentive payment will be made within 50 working days of subcontract award or while a challenge is pending. If a subcontractor is determined to be an ineligible participant, no incentive payment will be made under the Indian Incentive Program.

(2) The Contractor may request an adjustment under the Indian Incentive Program to the following:

(i) The estimated cost of a cost-type contract.
(ii) The target cost of a cost-plus-incentive-fee prime contract.
(iii) The target cost and ceiling price of a fixed-price incentive prime contract.
(iv) The price of a firm-fixed-price prime contract.

(3) The amount of the adjustment to the prime contract is 5 percent of the estimated cost, target cost, or firm-fixed-price included in the subcontract initially awarded to the Indian organization or Indian-owned economic enterprise.

(4) The Contractor has the burden of proving the amount claimed and must assert its request for an adjustment prior to completion of contract performance.

(c) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the amount paid to the subcontractor. The Contracting Officer will seek funding in accordance with agency procedures.

(End of Clause)

62. *FAR 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent

(1) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract or

(2) used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with

(i) specifications or written provisions forming a part of this contract or

(ii) 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 clause, 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.

(b) The Contractor agrees to include, and require inclusion of, this clause, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed the simplified acquisition threshold) however, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.

63. *FAR 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copy-right 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 under this contract, 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) The Contractor agrees to include, and require inclusion of, this clause in all subcontracts at any tier for supplies or services (including construction and architect-engineer subcontracts and those for material, supplies, models, samples, or design or testing services) expected to exceed the simplified acquisition threshold at FAR 2.101.

64. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)

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 United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of performing this contract or out of the use or disposal by or for the account of the Government of supplies furnished or work performed under this contract.

65. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(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.

66. FAR 52.228-1 BID GUARANTEE (SEP 1996) [NOTE: Not required for projects less than $100,000]

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

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

(c) The amount of the bid guarantee shall be twenty (20%) of the bid price or Three Million Dollars ($3,000,000), whichever is less.

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

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

67. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government;

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting Officer has the right to immediately draw on the ILC.

68. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [<u>For</u>

Contracts Exceeding $100,000]

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the kinds and minimum amounts of insurance required in the Schedule or elsewhere in the contract.

(b) Before commencing work under this contract, the Contractor shall notify the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective

(1) for such period as the laws of the State in which this contract is to be performed prescribe, or

(2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

69. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)

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

(1) Pledge of assets; and

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

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

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

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

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

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

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

70. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)

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

71. FAR 52.228-13 ALTERNATIVE PAYMENT PROTECTIONS (JULY 2000) [Applicable only for projects or delivery orders less than $100,000]

(a) The Contractor shall submit one of the following payment protections:

(1) A payment bond.

(2) An irrevocable letter of credit from a federally insured financial institution.

(b) The amount of the payment protection shall be 100 percent of the contract price.

(c) The submission of the payment protection is required within 10 days of contract award.

(d) The payment protection shall provide protection for the full contract performance period plus a one-year period.

(e) Except for escrow agreements and payment bonds, which provide their own protection procedures, the Contracting Officer is authorized to access funds under the payment protection when it has been alleged in writing by a supplier of labor or material that a nonpayment has occurred, and to withhold funds pending resolution by administrative or judicial proceedings or mutual agreement of the parties.

(f) When a tripartite escrow agreement is used, the Contractor shall utilize only suppliers of labor and material that signed the escrow agreement.

72. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

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

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

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

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

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

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

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

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

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

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

(A) 90 days following final payment; or

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

(d) Only federally insured financial institution rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the

ILC had letter of credit business of at least $25 million in the past year, ILCs over $5 million must be confirmed by another acceptable financial institution that had letter of credit business of at least $25 million in the past year.

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

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

Issue Date----------

Irrevocable Letter of Credit No.----------
Account party's name----------
Account party's address----------
For Solicitation No.----------
(For reference only)

TO: [U.S. Government agency]
[U.S. Government agency's address]

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

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

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

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

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

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

Sincerely,

[Issuing financial institution]

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

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

(Date) _____

Our Letter of Credit
Advice Number----------

Beneficiary:----------
[U.S. Government agency]
Issuing Financial Institution:----------
Issuing Financial Institution's LC No.:----------

Gentlemen:

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

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

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

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

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

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

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

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

Sincerely,

[Confirming financial institution]

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

SIGHT DRAFT

[City, State]

(Date) _____

[Name and address of financial institution]
Pay to the order of----------
[Beneficiary Agency] _____

the sum of United States $ _____
This draft is drawn under----------
Irrevocable Letter of Credit No.----------

[Beneficiary Agency]
By: _____

73. FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS (JULY 2000).

[This provision is Not Required for projects less than $100,000. See Clauses "Alternate Payment Protections" and "Inapplicable Provisions and Clauses".]

(a) *Definitions*. As used in this clause—

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

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

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

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

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

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

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

(d) *Surety or other security for bonds*. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the:

U.S. Department of Treasury
Financial Management Service
Surety Bond Branch
401 14th Street, NW, 2nd Floor, West Wing
Washington, DC 20227.

(e) *Notice of subcontractor waiver of protection (40 U.S.C. 270b(c).* Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.
(End of clause)

74. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (APR 2003) [For Contracts Exceeding $100,000]

(a) As used in this clause--

"All applicable Federal, State, and local taxes and duties," means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax," as used in this clause, means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is

required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax," means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

"Contract date," means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"Local taxes" includes taxes imposed by a possession or territory of the United States, Puerto Rico, or the Northern Mariana Islands, if the contract is performed wholly or partly in any of those areas.

(b) The contract price includes all applicable Federal, State, and local taxes and duties.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, 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.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds $250.

(g) The Contractor shall promptly notify the Contracting Officer of all matters relating to any Federal excise tax or duty that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax when the Contractor requests such evidence and a reasonable basis exists to sustain the exemption.

75. RESERVED

76. DFARS 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR) allowability shall also be determined in accordance with part 231 of the DoD FAR Supplement, in effect on the date of this contract.

77. *FAR 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (SEPT 2002)

(a) Payment of Price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress Payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

(ii) A listing of the amount included for work performed by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract under the contract.

(iv) A listing of the amounts previously paid to each such subcontractor under the contract.

(v) Additional supporting data in a form and detail required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer 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 also may be taken into consideration if--

(i) Consideration is specifically authorized by this contract; and

(ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.

(c) Contractor Certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph (c)(4) from the certification, the certification is still acceptable.) I hereby certify, to the best of my knowledge and belief, that--

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) All payments due to subcontractors and suppliers from previous payments received under the contract have been made, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

(Name)

(Title)

(Date)

(d) Refund of Unearned Amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and

(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or

(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, Liability, and Reservation of Rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for al material and work upon which payments have been made or the restoration of any damaged work; or

(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for Bond Premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final Payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;

(2) Presentation of a properly executed voucher; and

(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation Because of Undefinitized Work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest Computation on Unearned Amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and

(2) Deducted from the next available payment to the Contractor.

78. RESERVED.

79. *FAR 52.232-17 INTEREST (JUN 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, 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 (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(b) Amounts shall be due at the earliest of the following dates:

(1) The date fixed under this contract.

(2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination.

(3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.

(4) 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 a negotiated pricing agreement not confirmed by contract modification.

(c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

80. *FAR 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

81. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (FEB 2002)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments under the terms and conditions specified in this clause. The Government considers payment as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101, 32.001, and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see paragraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) *Invoice payments*—(1) *Types of invoice payments.* For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project.

(A) The due date for making such payments is 14 days after the designated billing office receives a proper payment request. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date is the 14th day after the date of the Contractor's payment request, provided the designated billing office receives a proper payment request and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232–5, Payments Under Fixed-Price Construction Contracts, is as specified in the contract or, if not specified, 30 days after approval by the Contracting Officer for release to the Contractor.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (*e.g.,* each separate building, public work, or other division of the contract for which the price is stated separately in the contract).

(A) The due date for making such payments is the later of the following two events:

(*1*) The 30th day after the designated billing office receives a proper invoice from the Contractor.

(*2*) The 30th day after Government acceptance of the work or services completed by the Contractor. For a final invoice when the payment amount is subject to contract settlement actions (*e.g.,* release of claims), acceptance is deemed to occur on the effective date of the contract settlement.

(B) If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date is the 30th day after the date of the Contractor's invoice, provided the designated billing office receives a proper invoice and there is no disagreement over quantity,

quality, or Contractor compliance with contract requirements.

(2) *Contractor's invoice.* The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(xi) of this clause. If the invoice does not comply with these requirements, the designated billing office must return it within 7 days after receipt, with the reasons why it is not a proper invoice. When computing any interest penalty owed the Contractor, the Government will take into account if the Government notifies the Contractor of an improper invoice in an untimely manner.

(i) Name and address of the Contractor.

(ii) Invoice date and invoice number. (The Contractor should date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (*e.g.,* discount for prompt payment terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to notify in the event of a defective invoice.

(viii) For payments described in paragraph (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232–5, Payments Under Fixed-Price Construction Contracts.

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFTbanking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision (*e.g.,* 52.232–38, Submission of Electronic Funds Transfer Information with Offer), contract clause (*e.g.,* 52.232–33, Payment by Electronic Funds Transfer—Central Contractor Registration, or 52.232–34, Payment by Electronic Funds Transfer—Other Than Central Contractor Registration), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(xi) Any other information or documentation required by the contract.

(3) *Interest penalty.* The designated payment office will pay an interest penalty automatically, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday, the designated payment office may make payment on the following working day without incurring a late payment interest penalty.

(i) The designated billing office received a proper invoice.

(ii) The Government processed a receiving report or other Government documentation authorizing payment and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) *Computing penalty amount.* The Government will compute the interest penalty in accordance with the Office of Management and Budget prompt payment regulations at 5 CFR part 1315.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in paragraph (a)(1)(ii) of this clause, Government acceptance or approval is deemed to occur constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. If actual acceptance or approval occurs within the constructive acceptance or approval period, the Government will base the determination of an interest penalty on the actual date

of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The prompt payment regulations at 5 CFR 1315.10(c) do not require the Government to pay interest penalties if payment delays are due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. The Government and the Contractor shall resolve claims involving disputes, and any interest that may be payable in accordance with the clause at FAR 52.233–1, Disputes.

(5) *Discounts for prompt payment.* The designated payment office will pay an interest penalty automatically, without request from the Contractor, if the Government takes a discount for prompt payment improperly. The Government will calculate the interest penalty in accordance with the prompt payment regulations at 5 CFR part 1315.

(6) *Additional interest penalty.* (i) The designated payment office will pay a penalty amount, calculated in accordance with the prompt payment regulations at 5 CFR part 1315 in addition to the interest penalty amount only if—

(A) The Government owes an interest penalty of $1 or more;

(B) The designated payment office does not pay the interest penalty within 10 days after the date the invoice amount is paid; and

(C) The Contractor makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) The Contractor shall support written demands for additional penalty payments with the following data. The Government will not request any additional data. The Contractor shall—

(*1*) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(*2*) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(*3*) State that payment of the principal has been received, including the date of receipt.

(B) If there is no postmark or the postmark is illegible—

(1) The designated payment office that receives the demand will annotate it with the date of receipt provided the demand is received on or before the 40th day after payment was made; or

(*2*) If the designated payment office fails to make the required annotation, the Government will determine the demand's validity based on the date the Contractor has placed on the demand, provided such date is no later than the 40th day after payment was made.

(b) *Contract financing payments.* If this contract provides for contract financing, the Government will make contract financing payments in accordance with the applicable contract financing clause.

(c) *Subcontract clause requirements.* The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) *Prompt payment for subcontractors.* A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) *Interest for subcontractors.* An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause—

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the **Federal Register,** for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) *Subcontractor clause flowdown.* A clause requiring each subcontractor to

(i) Include a payment clause and an interest penalty clause conforming to the standards set forth in paragraphs (c)(1) and (c)(2) of this clause in each of its subcontracts; and

(ii) Require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) *Subcontract clause interpretation.* The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that—

(1) *Retainage permitted.* Permit the Contractor or a subcontractor to retain (without cause) a specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) *Withholding permitted.* Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) *Withholding requirements.* Permit such withholding without incurring any obligation to pay a late payment penalty if—

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) The Contractor furnishes to the Contracting Officer a copy of any notice issued by a Contractor pursuant to paragraph (d)(3)(i) of this clause.

(e) *Subcontractor withholding procedures.* If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall—

(1) *Subcontractor notice.* Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) *Contracting Officer notice.* Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to paragraph (e)(1) of this clause;

(3) *Subcontractor progress payment reduction.* Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (e)(1) of this clause;

(4) *Subsequent subcontractor payment.* Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and—

(i) Make such payment within—

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under paragraph (e)(5)(i)) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the **Federal Register**, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) *Notice to Contracting Officer.* Notify the Contracting Officer upon—

(i) Reduction of the amount of any subsequent certified application for payment; or

(ii) Payment to the subcontractor of any withheld amounts of a progress payment, specifying—

(A) The amounts withheld under paragraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) *Interest to Government.* Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until—

(i) The day the identified subcontractor performance deficiency is corrected; or

(ii) The date that any subsequent payment is reduced under paragraph (e)(5)(i) of this clause.

(f) *Third-party deficiency reports*—(1) *Withholding from subcontractor.* If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a ''second-tier subcontractor'') a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under paragraph (e)(6) of this clause—

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (f)(1)(i) of this clause.

(2) *Subsequent payment or interest charge.* As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall—

(i) Pay the amount withheld under paragraph (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the **Federal Register**, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) *Written notice of subcontractor withholding.* The Contractor shall issue a written notice of any withholding to a subcontractor (with a copy furnished to the Contracting Officer), specifying—

(1) The amount to be withheld;

(2) The specific causes for the withholding under the terms of the subcontract; and

(3) The remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld.

(h) *Subcontractor payment entitlement.* The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.

(i) *Prime-subcontractor disputes.* A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the Government is a party. The Government may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) *Preservation of prime-subcontractor rights.* Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) *Non-recourse for prime contractor interest penalty.* The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the Government for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

(l) *Overpayments.* If the Contractor becomes aware of a duplicate payment or that the Government has otherwise overpaid on an invoice payment, the Contractor shall immediately notify the Contracting Officer and request instructions for disposition of the overpayment.

(End of clause)

82. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

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

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

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

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

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

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

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

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

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

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

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

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

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

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

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

(i) *Liability for change of EFT information by financial agent*. The Government is not liable for errors

resulting from changes to EFT information made by the Contractor's financial agent.

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

83. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)

(a) If the contractor is a small business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Undefinitized Contract Actions*) to 90 percent.

(b) If the contractor is a small disadvantaged business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Undefinitized Contract Actions*) to 95 percent.
(End of clause)

84. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)

(a) The Government will reimburse the Contractor for any advance payments made by the Contractor, as a mentor firm, to a protege firm, pursuant to an approved mentor-protege agreement, provided-

(1) The Contractor's subcontract with the protege firm includes a provision substantially the same as FAR 52.232-12, Advance Payments;

(2) The Contractor has administered the advance payments in accordance with the policies of FAR Subpart 32.4; and

(3) The Contractor agrees that any financial loss resulting from the failure or inability of the protege firm to repay any unliquidated advance payments is the sole financial responsibility of the Contractor.

(b) For a fixed price type contract, advance payments made to a protege firm shall be paid and administered as if they were 100 percent progress payments. The Contractor shall include as a separate attachment with each Standard Form (SF) 1443, Contractor's Request for Progress Payment, a request for reimbursement of advance payments made to a protege firm. The attachment shall provide a separate calculation of lines 14a through 14e of SF 1443 for each protege, reflecting the status of advance payments made to that protege.

(c) For cost reimbursable contracts, reimbursement of advance payments shall be made via public voucher. The Contractor shall show the amounts of advance payments made to each protege on the public voucher, in the form and detail directed by the cognizant contracting officer or contract auditor.
(End of clause)

85. *FAR 52.233-1 DISPUTES (JULY 2002)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

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

(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. However, a written demand or written

assertion by the Contractor seeking the payment of money exceeding $100,000 is not a claim under the Act until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) Contractors shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding $100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows:

'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; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.'

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of $100,000 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 over $100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which 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) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified if required), or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) 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.

86. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

87. RESERVED

88. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required, provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

89. *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;
(2) the availability of labor, water, electric power, and roads;
(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;
(4) the conformation and conditions of the ground; and
(5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself 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 the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

90. *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

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

91. RESERVED

92. *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

93. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

94. *FAR 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

95. *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

(1) at or near the work site, and

(2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refused to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

96. *FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

(a) The Contractor shall confine all operations (including storage of materials) on Government premises 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 the Contractor's performance.

(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities 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. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the 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 use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting 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, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

97. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

98. *FAR 52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

99. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall--

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails

or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontractors.

(f) Before commencing the work, the Contractor shall--

(1) Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and

(2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

100.*FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

101.FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

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

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

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

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

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

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

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail

(1) the proposed fabrication and assembly of structural elements, and

(2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

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

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

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

104. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

105. DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown--

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for--

(i) Material;

(ii) Labor,

(iii) Equipment;

(iv) Subcontracts; and

(2) Most cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

106. DFARS 252.236-7008 CONTRACT PRICES - BIDDING SCHEDULES (DEC 1991)

(a) The Government's payment for the items listed in the Bidding Schedule shall constitute full compensation to the Contractor for--

(1) Furnishing all plant, labor, equipment, appliances, and materials; and

(2) Performing all operations required to complete the work in conformity with the drawings and specifications.

(b) The Contractor shall include in the prices for the items listed in the Bidding Schedule all costs for work in the specifications, whether or not specifically listed in the Bidding Schedule.

107. *FAR 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

108. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines 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 (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the 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 that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract.

(c) A claim under this clause shall not 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 the suspension, delay, or interruption, but not later than the date of final payment under the contract.

109. FAR 52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

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

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

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

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

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

(1) the date, circumstances, and source of the order and

(2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, 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.

(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 such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. 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 the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

(1) receipt of a written change order under paragraph (a) of this clause or

(2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

110. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR Part 31 and DFARS Part 231, in effect on the date of this contract, apply.

111. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b)In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:
I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of may knowledge and belief.

(Official's Name)

(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation; and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to----

(1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or

(2) Final adjustment under an incentive provision of the contract.

(End of clause)

112. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)

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

"Approved purchasing system" means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquistion Regulation (FAR).

"Consent of subcontract" means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

"Subcontract," means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or sevices for performance of the the prime contract or a subcontract. It includes, but is not limited to purchase orders, and changes and modifications to purchase orders.

(b) This clause does not apply to subcontracts for special test equipment when the contract contains the clause at FAR 52.245-18, Special Test Equipment.

(c) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modification or unpriced delivery orders), and only if required in accordance with paragraph (d) or (e) of this clause.

(d) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified theshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other that the Coast Guard and the National Aeronautics and Space Administration, either the the simplified theshold or 5 percent of the total estimated cost of the contract.

(e) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

_____

_____

_____

(f)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (c), (d), or (e) of this clause, including the following information:

(i) A description of the supplies or services to be subcontracted.

(ii) Identification of the type of subcontract to be used.

(iii) Identification of the proposed subcontractor.

(iv) The proposed subcontract price.

(v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.

(vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.

(vii) A negotiation memorandum reflecting--

(A) The principal elements of the subcontract price negotiations;

(B) The most significant considerations controlling establishment of initial or revised prices;

(C) The reason cost or pricing data were or were not required;

(D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;

(E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and subcontractor; and the effect of any such defective data on the total price negotiated;

(F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and

(G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (c), (d), or (e) of this clause.

(g) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--

(1) Of the acceptability of any subcontract terms or conditions;

(2) Of the acceptability of any cost under this contract; or

(3) To relieve the Contractor of any responsibility for performing this contract.

(h) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(i) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement by the Government.

(j) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(k) Paragraphs (d) and (f) of this clause do not apply to the following subcontracts, which ere evaluated during negotiations:

_____

_____

_____

(End of clause)

113. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2002)

(a) *Definitions.* As used in this clause—

"Commercial item" has the meaning contained in the clause at 52.202-1, Definitions.

"Subcontract" includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c)(1) The Contractor shall insert the following clauses in subcontracts for commercial items:

(i) 52.219-8, Utilization of Small Business Concerns (Oct 2000) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds $500,000 ($1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212(a));

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(v) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (June 2000) (46 U.S.C. Appx 1241) (flowdown not required for subcontracts awarded beginning May 1, 1996).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

(End of clause)

114. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [For Government Property over $100,000]

(a) Government-furnished property.

(1) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications together with any related data and information that the Contractor may request and is reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(2) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use (except for 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 the contract's delivery or performance dates.

(3) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt of it, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either repair, modify, return, or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(4) If Government-furnished property is not delivered to the Contractor by the required time, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property.

(1) The Contracting Officer may, by written notice,

(i) decrease the Government-furnished property provided or to be provided under this contract, or

(ii) substitute other Government-furnished property for the 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 regarding the removal, shipment, or disposal of the property covered by such notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make the property available for performing this contract and there is any--

(i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above; or

(ii) Withdrawal of authority to use this property, if provided under any other contract or lease.

(c) Title in Government property.

(1) The Government shall retain title to all Government-furnished property.

(2) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. However, special tooling accountable to this contract is subject to the provisions of the Special Tooling clause and is not subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall government property become a fixture or lose its identity as personal property by being attached to any real property.

(3) Title to each item of facilities and special test equipment acquired by the Contractor for the Government under this contract shall pass to and vest in the Government when its use in performing this contract commences or when the Government has paid for it, whichever is earlier, whether or not title previously vested in the Government.

(4) If this contract contains a provision directing the Contractor to purchase material for which the Government will reimburse the Contractor as a direct item of cost under this contract--

(i) Title to material purchased from a vendor shall pass to and vest in the Government upon the vendor's delivery of such material; and

(ii) Title to all other material shall pass to and vest in the Government upon--

(A) Issuance of the material for use in contract performance;

(B) Commencement of processing of the material or its use in contract performance; or

(C) Reimbursement of the cost of the material by the Government, whichever occurs first.

(d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.

(e) Property Administration.

(1) The Contractor shall be responsible and accountable for all Government property provided under this contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.

(2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound industrial practice and the applicable provisions of Subpart 45.5 of the FAR.

(3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(4) The Contractor represents that the contract price does not include any amount for repairs or replacement for which the Government is responsible. Repair or replacement of property for which the Contractor is responsible shall be accomplished by the Contractor at its own expense.

(f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Risk of loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss or destruction of, or damage to, Government property upon its delivery to the Contractor or upon passage of title to the Government under paragraph (c) of this clause. However, the Contractor is not responsible for reasonable wear and tear to Government property or for Government property properly consumed in performing this contract.

(h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause. When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--

(1) Any delay in delivery of Government-furnished property;

(2) Delivery of Government-furnished property in a condition not suitable for its intended use;

(3) A decrease in or substitution of Government-furnished property; or

(4) Failure to repair or replace Government property for which the Government is responsible.

(i) Final accounting and disposition of Government property. Upon completing 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 (including any resulting scrap) not consumed in performing this contract or delivered to the Government. The Contractor 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 to the Government as the Contracting Officer directs.

(j) Abandonment and restoration of Contractor's premises. Unless otherwise provided herein, the Government--

(1) May abandon any Government property in place, at which time all obligations of the Government regarding such abandoned property shall cease; and

(2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or upon contract completion). However, if the Government-furnished property (listed in the Schedule or specifications) is withdrawn or is unsuitable for the

intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this clause may properly include restoration or rehabilitation costs.

(k) Communications. All communications under this clause shall be in writing.

(l) Overseas contracts. If this contract is to be performed outside of the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

115. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984) [For Government Property $100,000 or Less]

(a) The Government shall delivery to the Contractor, at the time and locations stated in this contract, the Government-furnished property described in the Schedule or specifications. If that property, suitable for its intended use, is not delivered to the Contractor, the Contracting Officer shall equitably adjust affected provisions of this contract in accordance with the Changed clause when--

(1) The Contractor submits a timely written request for an equitable adjustment; and

(2) The facts warrant an equitable adjustment.

(b) Title to Government-furnished property shall remain in the Government. The Contractor shall use the Government-furnished property only in connection with this contract. The Contractor shall maintain adequate property control records in accordance with sound industrial practice and will make such records available for Government inspection at all reasonable times, unless the clause at Federal Acquisition Regulation 52.245-1, Property Records, is included in this contract.

(c) Upon delivery of Government-furnished property to the Contractor, the Contractor assumes the risk and responsibility for its loss or damage, except--

(1) For reasonable wear and tear;

(2) To the extent property is consumed in performing this contract; or

(3) As otherwise provided for by the provisions of this contract.

(d) Upon completing this contract, the Contractor shall follow the instructions of the Contracting Officer regarding the disposition of all Government-furnished property not consumed in performing this contract or previously delivered to the Government. The Contractor 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 to the Government as directed by the Contracting Officer.

(e) If this contract is to be performed outside the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

116. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) below.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities,labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

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

(g) If the Contractor does not promptly replace or correct rejected work, the Government may

(1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or

(2) Terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

117. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or
(2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

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

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

118. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) Definitions.

As used in this clause--

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

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

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

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

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

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

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

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

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

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

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

(i) This Contract is a construction contract; or

(ii) The supplies being transported are-

(A) Noncommercial items; or

(B) Commercial items that-

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

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

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

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

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

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

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

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

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

(2) Required shipping date:

(3) Special handling and discharge requirements;

(4) Loading and discharge points;

(5) Name of shipper and consignee;

(6) Prime contract number, and

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

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

(1) Prime contract number;

(2) Name of vessel;

(3) Vessel flag of registry;

(4) Date of loading;

(5) Port of loading;

(6) Port of final discharge;

(7) Description of commodity;

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

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

(10) Name of the steamship company.

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

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

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

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

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

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
TOTAL		

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

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

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

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

119. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor--

(1) Shall notify the Contracting Officer of that fact; and

(2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of this contract.

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

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

(i) This Contract is a construction contract; or

(ii) The supplies being transported are-

(A) Noncommercial items; or

(B) Commercial items that-

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

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

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

120. FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) (ALERNATE I (APR 1984)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) of this clause.

(b) Definitions. "Collateral costs," as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) of this clause).

"Value engineering change proposal (VECP)" means a proposal that--

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change--

(i) In deliverable end item quantities only; or

(ii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in paragraphs (c) (1) through (7) of this clause. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those 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 and analysis 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

(i) the affected portions of the existing contract requirement and

(ii) 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 (h) of this clause.

(4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

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

(6) 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.

(7) 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) Submission. The Contractor shall submit VECP's to the Resident Engineer at the worksite, with a copy to the Contracting Officer.

(e) Government action.

(1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the

decision. The Government will process VECP's expeditiously; however, it will not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(3) 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 applied a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing.

(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by

(i) 45 percent for fixed-price contracts or

(ii) 75 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 to the contract price or fee.

(g) Deleted.

(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of $50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) of this clause, the Contractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.

(i) 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--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 value engineering change proposal 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. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of Clause)

121. *FAR 52.249-1 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM) (APR 1984) [For Contracts $100,000 or Less]

The Contracting Officer, by written notice, may terminate this contract, in whole or in part, when it is in the Government's interest. If this contract is terminated, the rights, duties, and obligations of the parties, including

compensation to the Contractor, shall be in accordance with Part 49 of the Federal Acquisition Regulation in effect on the date of this contract.

122. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) ALTERNATE I (SEP 1996) [For Contracts Over $100,000]

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts to the extent they relate to the work terminated.

(4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(6) As directed by the Contracting Officer, transfer title and deliver to the Government

(i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and

(ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b) (6) of this clause; provided, however, that the Contractor

(i) is not required to extend credit to any purchaser and

(ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1 year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and

acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (f) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Paragraph (f) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and the Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of the termination, the total (without duplication of any items) of--

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and

(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m) (1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

123. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if-

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

(i) acts of God or of the public enemy,

(ii) acts of the Government in either its sovereign or contractual capacity,

(iii) acts of another Contractor in the performance of a contract with the Government,

(iv) fires,

(v) floods,

(vi) epidemics,

(vii) quarantine restrictions,

(viii) strikes,

(ix) freight embargoes,

(x) unusually severe weather, or

(xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligation s of the parties will be the same as if the termination had been issued for the convenience of the Government.

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

124. 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.

125. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS

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

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

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

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

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

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

126. INAPPLICABLE PROVISIONS AND CLAUSES (Local Provision). [Applicable only for projects or delivery orders less than $100,000]

This provision applies only to delivery orders and projects less than $100,000.

Pursuant to Pub. L. 103-355, the following provisions and clauses, as noted below, are inapplicable to this contract:

(a) FAR 28.102-3, Miller Act requirements;
(b) Not Used;
(c) FAR 52.203-5, Covenant Against Contingent Fees;
(d) FAR 52.203-6, Restrictions on Subcontractor Sales to the Government;
(e) FAR 52.203-7, Anti-Kickback Procedures;

(f) FAR 52.222-4, Contract Work Hours and Safety Standards Act-Overtime Compensation; and
(g) FAR 52.223-6, Drug-Free Workplace, except for individuals.

DOCUMENT TABLE OF CONTENTS

DIVISION 00 - DOCUMENTS

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS

5/00, Rev 9/01

PART 1 GENERAL

1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)
1.1.1 Start Work
1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)
1.3 EXCEPTION TO COMPLETION TIME AND LIQUIDATED DAMAGES
1.4 CONTRACT DRAWINGS AND SPECIFICATIONS
1.4.1 SETS FURNISHED
1.4.2 DRAWING REPRODUCTION AND DISTRIBUTION
1.4.3 NOTIFICATION OF DISCREPANCIES
1.4.4 OMISSIONS
1.5 PHYSICAL DATA (APR 1984)
1.6 PAYMENT
1.6.1 PROMPT PAYMENT ACT
1.6.2 PAYMENTS FOR MODIFICATIONS
1.6.3 PAYMENT FOR MATERIALS DELIVERED OFFSITE (MAR 1995)
1.7 DAMAGE TO WORK
1.8 AVAILABILITY AND USE OF UTILITY SERVICES
1.9 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER
1.10 INSURANCE REQUIRED
1.11 CITY OF ARVADA MANICIPAL LICENSE
1.12 CONTRACTOR QUALITY CONTROL (CQC)
1.13 NONDOMESTIC CONSTRUCTION MATERIALS
1.14 DAILY WORK SCHEDULES
1.15 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)
1.16 AS-BUILT DRAWINGS
1.17 PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)
1.18 PROFIT
1.19 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES
1.20 DRAWING SCALES
1.21 WAGE RATE APPLICATION
1.22 (FAR 52.222-23) NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)
1.23 (EFARS 52.232-5002) CONTINUING CONTRACTS (MAR 1995)
1.24 (EFARS 52.236-5000) PLANT AND MATERIAL REMOVAL AFTER CONTRACT TERMINATION(MAR 1995)
1.25 RESTRICTIONS ON WORKDAYS AND TIMES
1.26 FEDERAL HOLIDAYS

PART 2 NOT USED

PART 3 NOT USED

-- End of Document Table of Contents --

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS
5/00, Rev 9/01

PART 1 GENERAL

Attachments:
General Wage Decision Nos. CO020012

1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall commence work under this contract within ten (10) calendar days after the date of receipt by him of Notice to Proceed, prosecute said work diligently, and complete the entire work except seeding ready for use not later than 730 calendar days after receipt of Notice to Proceed. The time stated for completion shall include final cleanup of the premises. (FAR 52.211-10)

1.1.1 Start Work

Evidence that the Contractor has started procurement of materials, preparation and submission of shop drawings, preparation of subcontracts, and other preparatory work will satisfy the requirement that work commence within ten (10) calendar days after receipt of Notice to Proceed. Therefore, work need not be commenced at the construction site within ten (10) calendar days.

1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract , the Contractor shall pay liquidated damages to the Government in the amount of $900 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause. (FAR 52.211-12)

1.3 EXCEPTION TO COMPLETION TIME AND LIQUIDATED DAMAGES

In case the Contracting Officer determines that seeding, and/or the specified maintenance thereof is not feasible during the construction period, such work will be excepted from the completion time and liquidated damages . This work shall be accomplished during the first seeding, period and the specified maintenance period following the completion date.

1.4 CONTRACT DRAWINGS AND SPECIFICATIONS

1.4.1 SETS FURNISHED

The contractor shall be responsible for making copies of specifications including amendments. The bid drawings as amended shall be utilized in the performance of the work until contract drawings (i.e., bid drawings that

have been posted with all amendment changes) are mailed to the Contractor. See paragraph below for contract drawing reproduction and distribution requirements. The work shall conform to the contract drawings, set out in the drawing index, all of which form a part of these specifications. The work shall also conform to the standard details bound or referenced herein.

1.4.2 DRAWING REPRODUCTION AND DISTRIBUTION

The Contractor shall reproduce multiple legible hard copy sets (half-size English unless directed otherwise) of contract drawings from Government provided CD-ROM containing read-only cal file drawings. Within 14 calendar days after receipt of CD-ROM containing read-only cal drawing files, the Contractor shall provide legible hard copy drawing sets to the addressees contained in the Contract Document Distribution List for Project in Appendix A to this specification. The Government will process no progress payments prior to receipt of the legible contract drawings. After receipt and distribution of the legible hard copy drawing sets, the Government will provide the Contractor with a CD-ROM containing editable CAD file drawings (format defined in Section 01040 AS-BUILT DRAWINGS). The Contractor shall prepare as-built drawings as defined in Section 01040 AS-BUILT DRAWINGS.

1.4.3 NOTIFICATION OF DISCREPANCIES

The Contractor shall check all CD-ROM drawing files furnished him immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. Dimensions marked on drawings shall be followed in lieu of scale measurements. Enlarged plans and details shall govern where the same work is shown at smaller scales. All scales shown are based on a standard drawing size of 28" x 40". If any other size drawings are furnished or plotted the contractor shall adjust the scales accordingly. The Contractor shall also advise his sub-contractors of the above. 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.

1.4.4 OMISSIONS

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.

1.5 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractors' information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys and borings . The data shown graphically and by symbol for each respective boring represents the actual geologic features observed and logged at the location given on the drawings. While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local minor variations

characteristic of the subsurface materials of this region could occur.

b. Weather conditions shall have been investigated by the Contractor to satisfy himself as to the hazards likely to arise therefrom. Complete weather records and reports may be obtained from the local U.S. Weather Bureau.

c. Transportation facilities shall have been investigated by the Contractor to satisfy himself as to the existence of access highways and railroad facilities. (FAR 52.236-4)

1.6 PAYMENT

1.6.1 PROMPT PAYMENT ACT

Pay requests authorized in CONTRACT CLAUSES clause: "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Pay requests will be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses will be submitted with the ENG Form 93, and the required certification will be included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer.

1.6.2 PAYMENTS FOR MODIFICATIONS

Payments may be made for cost bearing change orders within the scope of the contract only to the extent funds are authorized in the order on a two-part modification. Contractor pricing proposed must be submitted at the earliest possible time after the change order is issued, or at a specific time as directed by the Contracting Officer. At the discretion of the Contracting Officer, any and all payments may be withheld on the modification until the Contractor has submitted a qualifying price proposal, in as much detail as required by the Contracting Officer, and the final price has been agreed.

1.6.3 PAYMENT FOR MATERIALS DELIVERED OFFSITE (MAR 1995)

a. Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to: (1) materials required by the technical provisions; or (2) materials that have been fabricated to the point where they are identifiable to an item of work required under this contract.

b. Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item. Payment for materials delivered off-site includes petroleum products. (List additional items for which payments will be made for off-site delivery.) (EFAR 52.232-5000)

1.7 DAMAGE TO WORK

The responsibility for damage to any part of the permanent work shall be as

set forth in the CONTRACT CLAUSES clause: "Permits and Responsibilities." However, if, in the judgment of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by 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 CONTRACT CLAUSES clause: "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.

1.8 AVAILABILITY AND USE OF UTILITY SERVICES

Use of public and private utilities will be as found available. The Contractor shall make his own arrangements for use of public and private utilities.

1.9 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This clause specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the contract clause entitled "Default: (Fixed-Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

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

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

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

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

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(07)	(04)	(04)	(04)	(06)	(03)	(04)	(02)	(03)	(03)	(02)	(05)

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on

critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b. above, the contracting officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)". (ER 415-1-15)

1.10 INSURANCE REQUIRED

In accordance with CONTRACT CLAUSES clause: "Insurance Work on a Government Installation," the Contractor shall procure the following minimum insurance:

Type	Amount
Workmen's Compensation and Employer's Liability Insurance	$100,000
General Liability Insurance	$500,000 per occurrence
Automobile Liability Insurance	
Bodily injury	$200,000 per person and $500,000 per occurrence
Property damage	$ 20,000 per occurrence

(Coverages per FAR 28.307-2)

1.11 CITY OF ARVADA MANICIPAL LICENSE

The Contractor and all subcontractors will have to be licensed with the City of Arvada. See the City of Arvada "Municipal Contractor's License Application" attachment.

1.12 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01451 Contractor Quality Control.

1.13 NONDOMESTIC CONSTRUCTION MATERIALS

The List of nondomestic construction materials or their components included in the list set forth in paragraph 25.104 of the Federal Acquisition Regulation does not apply to the requirements of the contract clause entitled "Buy American Act Construction Materials".

1.14 DAILY WORK SCHEDULES

In order to closely coordinate work under this contract, the Contractor shall prepare a written agenda/meeting minutes and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next two week period. The Contractor shall provide a copy of modifications (MODs), Serial Letters, Requests for Information (RFIs)and any other innformation that is needed in the minutes of the meeting. Required temporary utility services, time and duration of interruptions, and protection of adjoining areas shall be included with the Contractor's proposed 2-week work schedule. At this meeting, the

Contractor shall also submit his schedule of proposed dates and times of all preparatory inspections to be performed during the next 2 weeks. Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings. Daily reports shall be completed and given to the Contracting Officer or Representative within 24 hours of work

1.15 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)

a. This statement shall become operative only for negotiated contracts where cost or pricing data is requested, and for modifications to sealed bid or negotiated contracts where cost or pricing data is requested. This clause does not apply to terminations. See 52.249-5000, Basis for settlement of proposals and FAR Part 49.

b. Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series of equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense Schedule," Region V. Copies of each regional schedule may be obtained through the following internet site: http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep.htm. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be developed using the formula provided in the schedule. For forward pricing, the Schedule in effect at the time of negotiations shall apply. For retrospective pricing, the Schedule in effect at the time the work was performed shall apply.

c. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

d. When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet. (EFARS 52.231-5000)

1.16 AS-BUILT DRAWINGS

See SECTION 01040 - AS-BUILT DRAWINGS

1.17 PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20) percent of the total amount of work

to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government. (FAR 52.236-1)

1.18 PROFIT

a. Weighted guidelines method of determining profit shall be used on any equitable adjustment change order or modification issued under this contract. The profit factors shall be as follows:

Factor	Rate	Weight	Value
Degree of Risk	20		
Relative difficulty of work	15		
Size of Job	15		
Period of performance	15		
Contractor's investment	5		
Assistance by Government	5		
Subcontracting	25		
	100		

b. Based on the circumstances of each procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. The value shall be obtained by multiplying the rate by the weight. The value column when totalled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

(1) Degree of Risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

(2) Relative Difficulty of Work. If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

(3) Size of Job. All work not in excess of $100,000 shall be weighted at .12. Work estimated between $100,000 and $5,000,000 shall be proportionately weighted from .12 to .05.

(4) Periods of Performance. Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

(5) Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

(6) Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government-owned property, equipment and facilities, and expediting assistance.

(7) Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.19 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES

It is the position of the Department of Defense that the Davis-Bacon Act, 40 U.S.C. 276a is applicable to temporary facilities such as batch plants, sandpits, rock quarries, and similar operations, located off the immediate site of the construction but set up exclusively to furnish required materials for a construction project on the site of the work. Clause "Payrolls and Basic Records" of the CONTRACT CLAUSES is applicable to such operations.

1.20 DRAWING SCALES

All scales shown are based on a standard drawing size of 28" x 40" . If any other size drawings are furnished or plotted, the contractor shall adjust the scales accordingly. The Contractor shall also advise his sub-contractors of the above.

1.21 WAGE RATE APPLICATION

For copies of Wage Rates, See Attachment GENERAL WAGE DECISIONS. Applicable to all work.

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

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

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

Goals for Minority Participation for Each Trade	Goals for Female Participation for Each Trade
13.8	6.9

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the

Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs Office.

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

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

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

(2) Employer identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

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

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

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Denver-Boulder SMSA-2080, which Jefferson county is a part of.

1.23 (EFARS 52.232-5002) CONTINUING CONTRACTS (MAR 1995)

a. Funds are not available at the inception of this contract to cover the entire contract price. 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, together with funds provided by one or more non-federal project sponsors will be reserved for this contract. The liability of the United States for payments beyond the funds reserved for this contract is contingent on the reservation of additional funds.

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

c. The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The Contracting Officer will promptly notify the Contractor of any additional funds reserved for the contract by issuing an administrative change order.

d. If earnings will be such that funds reserved for the contract will be exhausted before the end of any fiscal year, the Contractor shall give written notice to the Contracting Officer of the estimated date of exhaustion and 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 than 60 days prior to the estimated date of exhaustion.

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

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

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

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

i. If at any time it becomes apparent that the funds reserved for any fiscal year are in excess of the funds required to meet all payments due or to become due the Contractor because of work performed and to be performed under 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 excess.

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

1.24 (EFARS 52.236-5000) PLANT AND MATERIAL REMOVAL AFTER CONTRACT TERMINATION(MAR 1995)

Should this contract be terminated as provided in clause 52.232-5001 because of the failure of Congress to provide additional funds for its completion, the contractor may be permitted to remove plant and material on which payments for preparatory work have been made, subject to an equitable deduction from the amounts due the contractor to reimburse the United States for the unabsorbed value of such plant and material.

1.25 RESTRICTIONS ON WORKDAYS AND TIMES

Contractor work hours must comply with City of Arvada ordinance. Workdays are Monday through Saturday. Work can not begin before 7 a.m. in the morning and can not extend past 9 p.m. in the evening.

1.26 FEDERAL HOLIDAYS

The following Federal legal holidays are observed by this installation:

New Year's Day	1 January
Martin Luther King's Birthday	Third Monday in January
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	4 July
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	11 November
Thanksgiving Day	Fourth Thursday in November
Christmas Day	25 December

If a wage determination applies the number of holidays specified on it, it has priority over this clause.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

General Decision Number CO020012

General Decision Number CO020012 Superseded General Decision No. CO010012

State: Colorado

Construction Type:
HEAVY

County(ies):

ADAMS	DOUGLAS	MESA
ARAPAHOE	EL PASO	PUEBLO
BOULDER	JEFFERSON	WELD
DENVER	LARIMER	

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	03/01/2002
1	03/08/2002
2	04/05/2002
3	05/03/2002
4	06/21/2002
5	07/05/2002
6	07/19/2002
7	08/16/2002
8	09/13/2002
9	12/13/2002
10	01/10/2003

COUNTY(ies):

ADAMS	DOUGLAS	MESA
ARAPAHOE	EL PASO	PUEBLO
BOULDER	JEFFERSON	WELD
DENVER	LARIMER	

* ASBE0028A 01/01/2003

	Rates	Fringes
ASBESTOS WORKERS/INSULATORS (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)	18.57	5.95

BRCO0007F 01/01/2002

	Rates	Fringes
ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS, AND JEFFERSON COUNTIES		
BRICKLAYERS	21.27	6.60

---

* BRCO0007G 05/01/2002

	Rates	Fringes
EL PASO AND PUEBLO COUNTIES		
BRICKLAYERS	21.27	6.60

---

* CARP2834A 05/01/2002

	Rates	Fringes
MILLWRIGHTS	23.09	6.61

ELEC0012D 09/01/2002

	Rates	Fringes
PUEBLO COUNTY		
ELECTRICIANS:		
Electrical work where the total cost is $200,000 or less	18.98	7.94
Electrical work where the total cost is over $200,000	23.74	7.94

ELEC0068A 06/01/2002

	Rates	Fringes
ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS, JEFFERSON, LARIMER, AND WELD COUNTIES		
ELECTRICIANS	26.91	8.64

ELEC0111A 09/01/2002

	Rates	Fringes
LINE CONSTRUCTION:		
Lineman	27.36	20.75%+2.30
Groundman	14.05	20.75%+2.30

---

* ELEC0113C 01/01/2003

	Rates	Fringes
EL PASO COUNTY		
ELECTRICIANS	24.10	3%+10.59

ELEC0969B 06/01/2000

	Rates	Fringes
MESA COUNTY		
ELECTRICIANS	20.35	4%+5.14

ENGI0009A 05/01/2002

	Rates	Fringes
POWER EQUIPMENT OPERATORS:		
Blade:		
Rough	19.92	5.47
Finish	20.22	5.47
Bulldozer	19.92	5.47
Cranes:		
50 tons and under	20.07	5.47
51 to 90 tons	20.22	5.47
91 to 140 tons	20.37	5.47
141 tons and over	21.13	5.47
Forklift	19.57	5.47
Mechanic	20.07	5.47
Oiler	19.22	5.47
Roller:		
Self-propelled, rubber tires under 5 tons	19.57	5.47
Self-propelled, all types over 5 tons	19.92	5.47
Scraper:		
Single bowl under 40 cubic yards	20.07	5.47

Single bowl including pups 40 cubic yards and over and tandem bowls	20.22	5.47
Trackhoe	20.07	5.47

IRON0024F 08/01/2002

	Rates	Fringes
IRONWORKERS:		
Structural	22.00	7.61

LABO0086A 05/01/2002

	Rates	Fringes
LABORERS:		
Pipelayer	15.69	3.95

PLUM0003E 07/01/2002

	Rates	Fringes
ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS (Northern half), JEFFERSON, LARIMER AND WELD COUNTIES		
PLUMBERS	26.52	6.64

PLUM0020B 07/01/2002

	Rates	Fringes
PUEBLO COUNTY		
PLUMBERS & PIPEFITTERS:		
Free Zone - 0 to 40 miles	19.85	6.81

Zone 1 - 40 miles and over: $19.85 per hour + $32.00 per day per diem will be paid on projects over 40 miles (Zone 1) measured in practical driving miles by the shortest route, beginning at 5th and Main Streets in Pueblo, Colorado, when the employee stays overnight or drives their own vehicle.
Hazardous pay: Add $2.20 per hour to base rate.
Hazardous pay applies to projects at chemical plants, steel mills, cement plants, power generator plants, process piping at manufacturing plants, food processing plants, and all projects which may present a health hazard or serious personal injury.

PLUM0058B 07/01/2002

	Rates	Fringes
EL PASO AND DOUGLAS (Southern half) COUNTIES		
PLUMBERS & PIPEFITTERS	24.95	7.40

---

* PLUM0145B 05/01/2002

	Rates	Fringes
MESA COUNTY		
PLUMBERS & PIPEFITTERS	21.28	6.45

PLUM0208J 07/01/2002

	Rates	Fringes
ADAMS, ARAPAHOE, BOULDER, DENVER, DOUGLAS (Northern half), LARIMER AND WELD COUNTIES		
PIPEFITTERS	26.62	6.54

---

* SHEE0009B 07/01/2002

	Rates	Fringes
SHEET METAL WORKERS	24.94	9.65

SUCO1033A 12/20/2001

	Rates	Fringes
BOILERMAKERS	17.60	
CEMENT MASONS/CONCRETE FINISHERS	17.31	2.85
CARPENTERS:		
Form Building and Setting	16.97	2.74
All Other Work	15.14	3.37
IRONWORKERS, Reinforcing	18.83	3.90
LABORERS:		
Common	11.22	2.92
Landscape	12.56	3.21
Flagger	8.91	3.80
PAINTERS:		
Brush, Roller & Spray	15.81	3.26
POWER EQUIPMENT OPERATORS:		
Backhoe	16.36	2.48
Front End Loader	17.24	3.23
Skid Loader	15.37	4.41

TEAM0435A 05/01/2000

	Rates	Fringes
TRUCK DRIVERS:		
Pickup	14.21	5.27
Tandem/Semi and Water	14.93	5.27

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

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

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal

process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01040

AS-BUILT DRAWINGS

10/02; Rev 01/03

PART 1 GENERAL

1.1 DEFINITIONS
1.1.1 Red-Line Drawings
1.1.2 As-Built Drawings
1.1.3 Vellum Drawings
1.1.4 Black-Line Drawings
1.1.5 Full-Size Drawings
1.1.6 Half-Size Drawings
1.1.7 Modification Circle
1.1.8 Mylar Drawings
1.1.9 Electronic CADD Files
1.2 GENERAL REQUIREMENTS
1.3 PAYMENT
1.4 TRANSMITTAL OF AS-BUILT DRAWINGS
1.4.1 Preliminary As-Built Drawings
1.4.2 Final As-Built Drawings
1.4.3 As-Built Preparation
1.4.3.1 For Microstation (*DGN.) Files
1.5 PROCEDURE
1.6 TITLE BLOCKS
1.7 PROCEDURES FOR POSTING MODIFICATION CHANGES TO DRAWINGS
1.8 WORD ABBREVIATIONS
1.9 LEGEND SHEETS
1.10 CONTRACTOR SHOP DRAWINGS
1.11 INDEXING OF DRAWINGS

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL
3.2 SITE WORK
3.2.1 Utilities
3.2.2 Structures
3.2.3 Grades
3.3 STRUCTURAL
3.3.1 Steel
3.4 ELECTRICAL
3.4.1 PANELS
3.4.2 Controls

-- End of Section Table of Contents --

SECTION 01040

AS-BUILT DRAWINGS
10/02; Rev 01/03

PART 1 GENERAL

1.1 DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1 Red-Line Drawings

Contract drawings marked-up to show actual work performed to include necessary sketches, modification drawings, shop drawings and notes. Green ink is used to indicate work deleted from the contract. Red ink is used for additions and deviations from the contract.

1.1.2 As-Built Drawings

Professional finished vellum drawings and electronic CADD files developed from the original contract drawings that include all of the information from the redline drawings and suitable for half-size reproduction.

1.1.3 Vellum Drawings

Drawings on erasable Vellum 20# similar or equal to Xerox Zero solvent vellum.

1.1.4 Black-Line Drawings

Paper drawings reproduced from electronic CADD files or high quality reproducible drawings.

1.1.5 Full-Size Drawings

28 inches x 40 inches nominal size drawings with all details visually readable.

1.1.6 Half-Size Drawings

14 inches x 20 inches nominal size drawings with all details visually readable.

1.1.7 Modification Circle

A circle with a horizontal line through the center. The top half will contain the letter "P" with the bottom half containing the Modification number. The lettering standard will be 120/6 WRICO or similar.

1.1.8 Mylar Drawings

Drawings on polyester film, 3 or 5 mil, similar or equal to K & E Stabilene.

1.1.9 Electronic CADD Files

Electronic CADD files are files saved on CD-ROM in accordance with appropriate CADD standard. The CADD standard will include level on/off status, special characters, line wieghts, font, and size requirements.

1.2 GENERAL REQUIREMENTS

The work includes creation of vellumdrawings and electronic CADD files on Microstation SE for as-built drawings to accurately depict existing conditions of the project. As-Built Drawings will become the permanent record drawings of the construction. The Contractor is responsible for development of electronic CADD files in accordance with Omaha DistrictCADD standards Omaha District Microstation CADD Standards, which includes Microstation and Adobe Acrobat files regarding blocks, cells, fonts, standard drawings and standards, will be made available to the successful bidder. See requirements in this section and folder on solicitation CD-ROM labled "CADDSTD" file named "CADDSTD.PDF" for a summary of Omaha District Microstation file requirements. The Contractor shall be responsible for furnishing the required CAD software. The Omaha District will furnish a CD of CAD (read-write) contract drawing files in the software language specified in paragraph Procedure below. This is the software language required by the Using Service. These drawing files shall be used to prepare required As-Built drawings. The As-Built drawings shall include all major features of the work and all details to the same level as the original contract set of drawings. All changes from the contract drawings, including but not limited to all deviations, additional information, and modifications to the contract. Where contract drawings or specifications allow for options, only the option selected and actually constructed shall be shown on the As-Built Drawings. Systems designed or enhanced by the Contractor such as HVAC control system, fire alarm system fire sprinkler system, irrigation sprinkler system, letters of clarification, shall be accurately and neatly recorded on the As-Built Drawings using the same symbols, terminology, and general quality as the original set of contract drawings. All sheets affected by a change shall be revised. The transmittal requirements for the As-built Drawings shall be shown as events on the Contractor prepared project schedule.

1.3 PAYMENT

In accordance with the clause "Payment Under Fixed - Price Construction Contracts", which provides for progress payments on estimates of work accomplished (which meets the standards of quality established under the contract), $21,500 will be withheld from payment for the creation of As-Built drawings until the final as-built drawings are delivered to the Contracting Officer (including any necessary revisions and subject to the approval of the Contracting Officer).

The Government will assign the Contractor a performance rating (CCASS for Corps of Engineers projects) upon completion of the project. The timeliness of satisfactory As-Built drawing submittals will be an important factor in determining the assigned rating. An unsatisfactory performance of As-Built drawings creation will be given to the Contractor if the Contractor demonstrates an unwillingness to work with the Government on As-Built drawing creation or the Contractor fails to submit satisfactory Final As-Built drawings within 60 calendar days of turning the completed project over to the Using Service.

1.4 TRANSMITTAL OF AS-BUILT DRAWINGS

1.4.1 Preliminary As-Built Drawings

The Contractor shall produce Preliminary As-Built Drawings indicating as-built conditions on Microstation SE with "clouding".The Contractor shall contact Jim Janicek at (402)221-4519 before beginning As-Built preparation. As-Built preparation process is provided in paragraph As-Built Preparation below. Preliminary drawings shall consist of 15 percent of total project drawings. These drawings shall be sheets used for the construction of this project (exludes Cover Sheet, Vicinity Map, Location Plan and Indexes). The As-Built CADD files which include all changes up to the time Preliminary Drawings shall be sent as stated below. The Contractor shall draw attention to all drawing changes by "clouding" the affected area. This "clouding" shall be accomplished on layer 63 of the drawing file. The Preliminary Drawings shall consist of one (1) set of CADD files on a CD-ROM and one (1) full-size set of the Black-Line Drawings. One (1) set of CADD files on a CD-ROM shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). One (1) full-size set of the Black-Line Drawings shall be submitted to the COR. Both documents shall be submitted three (3)weeks prior to the final acceptance inspection unless otherwise directed by the COR. The COR will notify the Contractor in writing of approval / disapproval. The Contractor shall not submit the Final Drawings until he receives the COR's letter approving the Preliminary Drawings.

1.4.2 Final As-Built Drawings

The Contractor shall produce Final As-Built Drawings on Microstation SE without "clouding". As-Built preparpation process is provided in paragraph As-Built Preparation below. The Final Drawings shall include all changes. The Final Drawings in the form of a CD-ROM shall be submitted to the COR and Omaha District Office (CENWO-ED-DI) no earlier than the day of acceptance of the project and no later than thirty (30) days after the date on the acceptance letter for the Preliminary Drawing unless otherwise directed by the COR. (Note: Final drawings shall not be forwarded to the customer. Corps of Engineers, Omaha District COR will forward to the customer after Quality Review.) Contractor shall submit one (1) set of CADD files on a CD-ROM to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). Contractor shall send the following documents to the COR:

a) One (1) set of CADD files on CD-ROM (folder name containing as-built files shall be designated "AS-BUILTS" on each CD-ROM). Both CD case and CD-ROM shall contain the name of the project, location, specification number, and contract number, and words "As-Built Record Set"). The folder shall contain drawings, indexes and X-REF files related to all as-builts.

b) One (1) full-size set of vellumAs-Built Drawings, along with all red-lined hard copy drawings prepared by the Contractor during construction.

COR will forward one (1) full-size set of drawings along with CD-ROM to the customer.

1.4.3 As-Built Preparation

Both preliminary and final electronic as-built drawings shall be produced in accordance with the following process for MicroStation drawings:

1.4.3.1 For Microstation (*DGN.) Files

a. When opened, the drawing shall be seen exactly as it should be

plotted.
b. Only one view port is open in the file.
c. The view shall be zoomed to fit the border.
d. All information in the title block shall be filled in, including plot scale.
e. The information in the title block shall be correct, including the design file name and the plot scale.
f. All files shall reference a MicroStation border supplied by the Omaha District.
g. Detach all unused reference files.
h. For any half tone references, the logical name shall have common first or last character(s). Preferably use "_xxx" at the end of the logical name. Include this information with the pertinent information.
i. All unnecessary information outside the border shall be deleted.
j. All files shall be compressed.
k. The font resource file used shall be included with the set, even if it is the standard MicroStation font resource.
l. An ASCII text file shall be provided with the following information: reference file paths that should be added to MS_RFDIR, the name of your font resource file, the name and phone number of the person we need to contact if we have problems, and the version of MicroStation used to create and/or work on the drawings.

1.5 PROCEDURE

One (1) CD-ROM containing the contract drawings (read-write CADD files) and CADD standards in Microstation SE format, for use in the preparation of As-Built Drawings by the Contractor, will be forwarded to the Resident Engineer. This CD-ROM will then be furnished to the Contractor after signed receipt to the Resident Engineer. The Contractor shall create a set of electronic Cadd files and full-size Red-Line Drawings to fully indicate As-Built conditions. The Red-Line Drawings shall be maintained at the site, in a current condition until the completion of the work and shall be available for review by the COR at all times. All as-built conditions shall be on the Red-Line Drawings within two (2) days after the work activity is completed or shall be entered on the deficiency tracking system (see Section 01451A, CONTRACTOR QUALITY CONTROL). The Contractor shall not convert electronic drawing files from one software language to another (i.e. Microstation to AutoCADD or AutoCADD to Microstation).

1.6 TITLE BLOCKS

The contract number and the specification number (if available) shall be shown on all sheets. "RECORD DRAWING" shall be added below the title block on all sheets. All modifications to the contract shall be posted in ascending order. The top line of the revision box shall state "REVISED TO SHOW AS-BUILT CONDITIONS" and dated. All modifications to all plans, sections, or details, shall have a modification number placed in the revision box under column entitled "Symbol". The statement "GENERAL REVISIONS" may be used when applicable. The date to be added in the revision box for modifications is found in Block 3 of Form SF-30. Cover Sheet will have Contract Award Set changed to As-Built Record Set with month & year completed. Month and year completed will also go in the date box in the title block. There will be no separate dates.

1.7 PROCEDURES FOR POSTING MODIFICATION CHANGES TO DRAWINGS

Follow directions in the modification for posting descriptive changes.

A Modification Circle shall be place at the location of each deletion.
The highest modification number on the sheet should be shown in the modification circle in the "DATE" and "DRAWING CODE" boxes of the title block.
For all new details or sections that are added to a drawing, place a Modification Circle by the detail or section title.

For changes to a drawing, place a Modification Circle by the title of the affected plan, section or detail titles (each location).
For changes to schedules on drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.
The Modification Circle size shall be 1/2-inch diameter unless the area where circle is to be placed is crowded. Use smaller size circle for crowded areas.

1.8 WORD ABBREVIATIONS

Abbreviations shown on the abbreviation sheet shall be used to describe all work items. Additional word abbreviations, not found on the abbreviation sheet but necessary to describe the work, shall be properly identified and incorporated with the other standard word abbreviations.

1.9 LEGEND SHEETS

Symbols, which conflict with those on the original contract legend sheet, shall not be used. Additional symbols, necessary to depict any additional work items, shall be properly identified and added to the legend sheet or supplemental legend. Those projects that do not have legend sheets may use supplemental legends on each sheet where symbol is shown.

1.10 CONTRACTOR SHOP DRAWINGS

Contractor shop drawings,which supersede data on the contract plans and/or additional drawings, prepared by the Contractor, shall be incorporated into the As-Built Drawings. Design plans prepared by Contractor shall include the designer's name on the As-Built Drawings.

1.11 INDEXING OF DRAWINGS

If drawings are added to the portfolio of drawings to depict as-built conditions, the index of drawings shall be revised accordingly.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

As-Built drawings shall include as-built information to the same level of detail as shown on the original details, unless otherwise specified. The Contractor shall provide any additional full-size drawings as required to display all the details.

3.2 SITE WORK

3.2.1 Utilities

All utilities shall be shown whether active, inactive, shown on the original contract drawings, or found on-site. The type of utility, location, general direction, size, material make-up and depth shall be shown. The location and description of any utility line or other installations of any kind known to exist within the construction area shall be shown. The location shall include dimensions to permanent features.

3.2.2 Structures

Structures above and below ground shall be shown. The size, material make-up, location, height, and/or depth shall be shown. Manholes shall show rim elevation and invert elevations as applicable. Power poles shall show electrical equipment and voltage rating.

3.2.3 Grades

Grade or alignment of roads, structures, or utilities shall be corrected if any changes were made from the contract drawings. Elevations shall be corrected if changes were made in site grading.

3.3 STRUCTURAL

3.3.1 Steel

Shop drawings that deviate from the contract drawings shall be incorporated in the As-Built Drawings.

3.4 ELECTRICAL

3.4.1 PANELS

All contract drawing panel schedules shall be revised to show as-built conditions. Home-run circuit designation on electrical drawings shall accurately correspond to the as-built panel schedules.

3.4.2 Controls

All control diagrams in contract drawings shall be revised to reflect as-built conditions, and setpoints.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01200

CONSTRUCTION GENERAL

5/00; Rev 01/02

PART 1 GENERAL

1.1 SCOPE
1.2 CONSTRUCTION RIGHT-OF-WAY
1.3 PROTECTION OF EXISTING FACILITIES AND WORKS
1.3.1 Protection of Appurtenances from Bituminous Material Applications
1.3.2 Interruption of Electric Power
1.3.3 Flood Protection Works
1.4 CARE OF WATER
1.5 DISPOSITION OF CONSTRUCTION FACILITIES
1.6 EXCESS SPOIL
1.7 ACCESS ROADS
1.7.1 Access Roads
1.8 PUBLIC ROADS
1.8.1 Traffic Control
1.8.2 Operations
1.8.3 Barricades, ROAD OR STREET CLOSURE
1.8.4 State and Federal Highways
1.8.5 State and Local Public Roads
1.8.6 City Streets
1.8.7 Utility Lines
1.8.7.1 LICENCED ELECTRICIAN
1.8.8 WATER VALVES
1.9 COOPERATION WITH OTHERS
1.10 WORK BY OTHERS
1.11 CONSTRUCTION PHASING
1.12 SUBMITTALS
1.13 SPECIAL INSTRUCTIONS FOR PROGRESS CHARTS
1.14 PROJECT SIGN
1.15 WARRANTY OF CONSTRUCTION (MAR 1994)
1.16 ACCOMMODATIONS FOR GOVERNMENT PERSONNEL
1.17 PORTABLE TOILETS

PART 2 NOT USED

PART 3 NOT USED

-- End of Section Table of Contents --

SECTION 01200

CONSTRUCTION GENERAL
5/00; Rev 01/02

PART 1 GENERAL

Attachments: Standard Drawings Nos. OD15-9A12 and OD15-9A24

1.1 SCOPE

The work covered in this section is outlined as a statement of construction requirements common to all the work. Specific requirements for materials and installations are provided under the Technical Sections herewith. No claims for extras shall be made on account of items presumed to have been omitted from this section.

1.2 CONSTRUCTION RIGHT-OF-WAY

The Contractor will be assigned working areas or working right-of-way limits for use in the prosecution of work under this contract, subject to the CONTRACT CLAUSES clause entitled "Operations and Storage Areas."

1.3 PROTECTION OF EXISTING FACILITIES AND WORKS

The Contractor shall be responsible for the protection of the work area from damage and upon completion of the work shall leave existing works in a condition equal to that which existed when the work started. All work, storage of materials, and construction plant shall be kept within the limits of the areas assigned. Prior to construction operations, the Contractor shall confer with the Contracting Officer's representative to determine the proximity of any possible under-ground obstructions, pipe or equipment which could be damaged as a result of construction operations. Existing utility lines that are shown on the drawings or the locations are otherwise made known to the Contractor shall be protected from damage, and if damaged, shall be repaired by the Contractor at no additional expense to the Government. In the event that the Contractor damages any existing utility lines that are not shown or the locations of which have not been made known to the Contractor, report thereof shall be made immediately to the Contracting Officer. If the Contracting Officer determines that repairs shall be made by the Contractor, such repairs will be ordered under CONTRACT CLAUSES clause entitled "Changes." The Contractor will be responsible for the protection of structures from any structural damage during the construction operations. Roads and surfaces shall be protected from damage by the work or if damaged shall be repaired with equal materials at no additional expense to the Government. At all times the plant and work areas shall be kept in a condition conducive to safety of workmen and the public and neat in appearance. Waste or surplus materials shall not be allowed to accumulate in the construction areas.

1.3.1 Protection of Appurtenances from Bituminous Material Applications

It shall be the responsibility of the Contractor to cover and protect the surfaces of roadway appurtenances, structures and installations by approved

methods in advance of any bituminous material application adjacent thereto. Damages or defacement thereof shall be corrected as directed, by and at the expense of the Contractor.

1.3.2 Interruption of Electric Power

If it is necessary to cut off power in transmission lines that pass through construction areas, it shall be the Contractor's responsibility to make the necessary arrangements with the owner of the powerline, and the Contractor shall pay all costs therefor.

1.3.3 Flood Protection Works

In all cases where materials in the existing flood protection works are used or connected with the construction of new work under this contract, the work shall be so planned and executed that the new work shall be completed to provide protection equivalent to the existing protection as the existing protection is weakened or removed. These operating restrictions shall be followed in order that the new work may be tied in, or connected promptly, by the Contractor, with the existing facilities so as to furnish a continuous service in an emergency. These ties or connections shall be made during periods of suspended construction operations and the Contractor shall leave incompleted pipe outlets and other structures in such conditions as to not interfere with the natural drainage from areas served by these pipes or structures.

1.4 CARE OF WATER

Full responsibility for care of water shall be borne by the Contractor until completion of work under this contract. The Contractor shall provide the materials and equipment and perform all work necessary to facilitate construction and to protect the work from damage by water. The Contractor shall make his own investigations and determinations of conditions, both existing and anticipated concerning care of water. Plans for care of water are subject to approval by the Contracting Officer prior to construction. Facilities shall be removed upon completion of the work.

1.5 DISPOSITION OF CONSTRUCTION FACILITIES

All buildings and facilities constructed by the Contractor shall be maintained in a satisfactory condition with strict observance of the rules of sanitation, safety and order as may be established by the Contracting Officer. Prior to final payment under the contract, all buildings and facilities constructed by the Contractor for his own use shall be removed from the site by the Contractor.

1.6 EXCESS SPOIL

Contractor must identify in writing, the specific location that any excess spoil is placed off site.

1.7 ACCESS ROADS

1.7.1 Access Roads

Access roads as required for the prosecution of the work shall be maintained (including sprinkling for dust control, safety personnel, signals and control) within the work areas assigned to the Contractor. Consideration shall be given to the avoidance of interference with others,

safety and frequency of traffic, subject to review and approval prior to construction. Access road areas shall be restored to their original or suitable condition upon completion of this contract. The Contractor shall be responsible for repair of damage to existing roads caused by his operation.

1.8 PUBLIC ROADS

1.8.1 Traffic Control

The Contractor shall be responsible for the safe control of traffic on all haul and access roads used primarily for the work under these specifications and at their crossings with roads used by others. The Contractor shall, at his own expense, furnish all personnel, signal devices and signal necessary for the safe and efficient control of construction traffic on road systems used by the Contractor. A plan for traffic control, including a listing of equipment and its employment, shall be submitted for review and approval prior to construction.

1.8.2 Operations

When operations are being conducted near a U. S. or State Highway or when construction equipment is being used on or adjacent to such highway, the Contractor shall furnish signalmen and such warning signs as are necessary to provide adequate warning to the traveling public. The highways and streets shall be kept open at all times.

1.8.3 Barricades, ROAD OR STREET CLOSURE

At each location designated by the Contracting Officer and where safe operation requires the closing of roads, streets or other travel arteries leading to the work under this contract, the Contractor shall maintain a heavy plank barricade or other effective barrier during construction. Arrangements for closure of roads, streets or other travel arteries shall be made by the Contractor with local State, County or City officials. The Contractor shall notify the appropriate official in writing at least three (3)weeks in advance of the date he desires to close a road to traffic and shall furnish a copy of the agreement to the Contracting Officer prior to closure. A satisfactory sign shall be placed on each barricade stating that the artery is closed. The cost of barricades shall be at the expense of the Contractor.

1.8.4 State and Federal Highways

Where the Contractor hauls across or on State or Federal highways, he shall enter into all agreements with the State Highway Commission and shall comply with any restrictions they may impose relative to load limits, care of traffic and cleanup. Such agreements shall clearly relieve the Government of any responsibility for damages resulting from hauling across or on State highways. Copies of such agreements shall be furnished to the Contracting Officer before the Contractor begins hauling on these highways.

1.8.5 State and Local Public Roads

(a) Load Limits:

The Colorado Highway Commission and local County Road Commissions restrict the load weights of haul vehicles using highways and county roads during the spring thaw period. The load restrictions are usually imposed from 1

April through June depending on actual weather conditions.

(b) Hauling Regulations:

Prior to start of hauling operations on public roads, the Contractor shall furnish evidence to the Contracting Officer that an agreement has been consummated with State and County officials on the use of public roads and bridges. Such agreements shall clearly relieve the Government of any responsibility for damage resulting from hauling across or on these roads.

1.8.6 City Streets

Where the Contractor intends to cross or to use city streets for haul roads he shall enter into an agreement with the City and shall comply with any restrictions the City may impose relative to load limits, care of traffic and cleanup. Such agreements shall clearly relieve the Government of any responsibility for damage resulting from hauling across or on these highways. A copy of all such agreements shall be furnished the Contracting Officer before the Contractor begins hauling in city streets.

1.8.7 Utility Lines

It shall be the responsibility and obligation of the Contractor to make all arrangements with the affected companies for the necessary moving and alterations of utility lines and the continuation of service during construction as covered by the plans and specifications.

1.8.7.1 LICENCED ELECTRICIAN

All electrical work must be done by a licensed electrician. See the City of Arvada's Application For Contractors Licencse and Electrical Registration attached to this spec.

1.8.8 WATER VALVES

The City of Arvada will open and shut-off water valves for the contractor.

1.9 COOPERATION WITH OTHERS

The Contractor shall cooperate and coordinate his work with that of others as required for orderly completion of all work. In the event of disagreement between the Contractor and others, the decision of the Contracting Officer shall be final.

1.10 WORK BY OTHERS

Public and private authorities may be working in the area during the life of this contract. The Contractor shall coordinate his work with others to avoid undue interference, and shall conduct his operations, other than required access, within the limits of the assigned construction area or construction right-of-way limits. Specifications and drawings showing work under other contracts are available for examination at the Corps of Engineers District Office, 215 North 17th Street, Omaha, Nebraska 68102-4978, or at the Office of the Area Engineer , . Contractors shall also check with the City of Arvada, for construction scheduled in the area during project construction.

1.11 CONSTRUCTION PHASING

Phasing requirements are addressed in specification section 01900.

1.12 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Proposed Methods of Operation; G-AO

Progress Charts; G-AO

Construction Right-of-Way

Right-of-Way Agreements

State and Federal Highways

Agreements for hauling on highways

State and Local Public Roads

Agreements for hauling on roads

SD-02 Shop Drawings

Care of Water; G-AO

Traffic Control; G-AO

SD-11 Closeout Submittals

Warranty of Construction

List of warranties with copy of each

1.13 SPECIAL INSTRUCTIONS FOR PROGRESS CHARTS

To be submitted in accordance with the CONTRACT CLAUSES clause entitled "Schedule for Construction Contracts" shall indicate the required data for each of the principal features of the work. Contract changes or modifications will not include extensions of time unless the updated progress chart shows that the contract completion date is delayed due to the affect of the change on one or more principal features of the work.

1.14 PROJECT SIGN

The Contractor shall provide a new project sign constructed in accordance with Standard Drawings Nos. OD15-9A12 and OD15-9A24 bound herein. The sign shall be erected at the project site by the Contractor at the location determined by the Contracting Officer. The project sign shall remain the property of the Contractor and upon completion of the contract, work shall

be removed from the premises by the Contractor. . No separate payment will be made for the sign.

1.15 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

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

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or

subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud. (FAR 52.246-21)

1.16 ACCOMMODATIONS FOR GOVERNMENT PERSONNEL

The Contractor shall furnish and maintain an office type trailer for the use of Government inspectors. The trailer shall have a minimum floor space of 200 sq. ft. The trailer shall meet the following requirements: Sufficient blocks to steady the trailer when spotted for use. An entrance near each end with each entrance equipped with a door with fixed window and screen door. Approximately 40 sq. ft. ventilating type of window space with all windows having louvered screens or screens and awnings or venetian blinds. Floors, ceiling and walls to be insulated. Ceiling vents with at least one having an exhaust fan. Varnished plywood interior. Inlaid linoleum covered floors. Ceiling light operated from switch at door. Fluorescent 2-40 watt tube fixtures at each end of trailer. Double electric outlets located near ends of trailer with one exterior weatherproof outlet. Electric 5-gal. water cooler with two plastic bottles. Forced-air central oil or gas heating unit with minimum capacity of 15,000 B.t.u. per hour, thermostatic controlled. Thermostatically controlled 12,000 B.t.u. air conditioning unit. Wardrobe of approximately 48 inch length. Kneehole desk 30" x 32" x 5'0", with 3 drawers on each side of the kneehole; drafting stool, swivel chair with arms, 4 straight-back or folding chairs. Drafting table on shelf with built-in cabinets below. Plan rack capable of holding approximately 75 standard drawings. Five lb. CO_2 fire extinguishers. Exterior toilet facilities. The trailer shall be located at the direction of the Contracting Officer. The Contractor shall provide accommodations, janitor service, fuel for light plant and heating facilities, electricity, telephone and water, all at no cost to the Government, except that the Contractor will not be liable for Government long-distance calls. Upon completion of the contract, the trailer shall remain the property of the Contractor and shall be removed from the site of the work.

1.17 PORTABLE TOILETS

Toilet facilities will not be available for Contractor's use. The Contractor shall provide and maintain portable toilets for use by the Contractor's staff. Toilet(s) shall be placed at the location directed by the Contracting Officer. To prevent overturning by high winds, all portable toilets shall be anchored down.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 10

A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 10

Note: Above lettering styles are Helios Extra Bold Condensed and Helios Bold II. Helvetica Black Roman and Helvetica Bold Roman are acceptable substitutes.

STANDARD
ALPHABET & NUMERALS

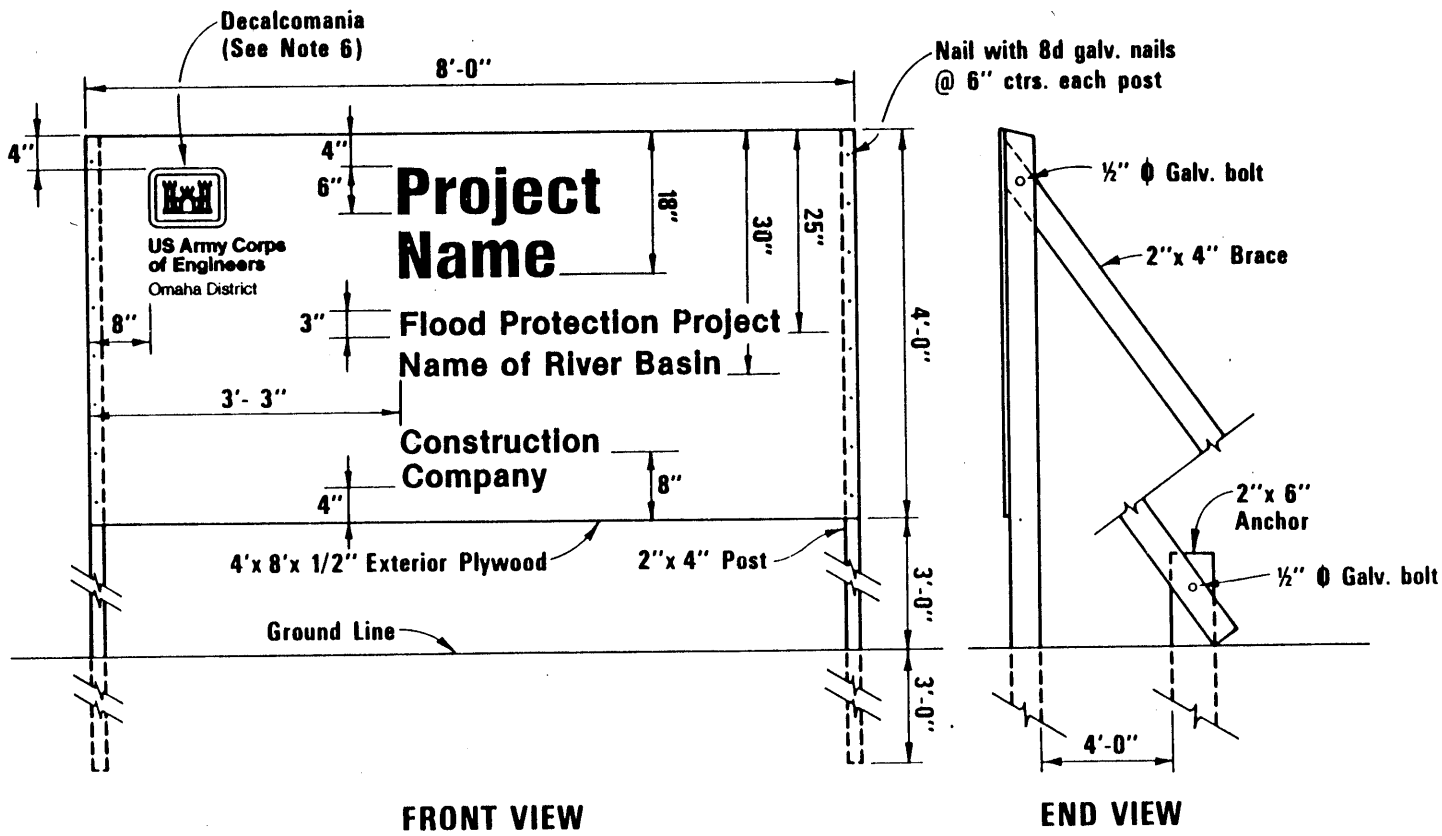
OFFICE OF THE DISTRICT ENGINEER
OMAHA, NEBRASKA
REV. NOVEMBER, 1982

00800AT1

OD15-9A12

NOTES:

1. Posts to be S4S.
2. Plywood shall be exterior type, A-C grade.
3. Before painting, surface to be clean, dry, free from grease and sanded.
4. Paint with one prime coat zinc oxide and two finish coats grey, Pantone "402" or #26357 in Fed. Std. 595, semi-gloss, enamel, conforming to Fed. Specs. TT-P-102.
5. All lettering to be white enamel on grey background.
6. Decalcomania for Corps of Engineers insignia will be furnished by the Contracting Officer for installation by the Contractor.



STANDARD
PROJECT SIGN
FLOOD PROTECTION

OFFICE OF THE DISTRICT ENGINEER
OMAHA, NEBRASKA
REV. NOVEMBER, 1982

OD15-9A24

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

09/01; Omaha Update 02/03

PART 1 GENERAL

1.1 CONTRACTOR RESPONSIBILITIES
1.2 SUBMITTAL IDENTIFICATION (SD)
1.3 SUBMITTAL CLASSIFICATION
1.3.1 Government Approved
1.3.2 Information Only (FIO)
1.3.3 Administrative Submittals
1.4 APPROVED SUBMITTALS
1.5 DISAPPROVED SUBMITTALS
1.6 WITHHOLDING OF PAYMENT
1.7 GENERAL
1.8 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER
1.9 SCHEDULING
1.10 TRANSMITTAL FORM (ENG FORM 4025)
1.11 SUBMITTAL PROCEDURES
1.11.1 Procedures
1.11.1.1 "G-DO" or "G-AE" Submittals
1.11.1.2 "G-AO" and FIO Submittals
1.11.1.3 Certificates of Compliance
1.11.1.4 Purchase Orders
1.11.1.5 Operation and Maintenance Instructions and/or Manuals
1.11.2 Deviations
1.12 CONTROL OF SUBMITTALS
1.13 GOVERNMENT APPROVED SUBMITTALS
1.13.1 "G-AE" or "G-DO" Submittals
1.13.2 "G-AO" Submittals
1.14 INFORMATION ONLY SUBMITTALS
1.15 STAMPS

-- End of Section Table of Contents --

SECTION 01330

SUBMITTAL PROCEDURES
09/01; Omaha Update 02/03

PART 1 GENERAL

Attachments: Submittal Register
ENG Form 4025, Transmittal Form

1.1 CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for total management of his work including scheduling, control, and certification of all submittals. The submittal management system provided in these specifications is intended to be a complete system for the Contractor to use to control the quality of materials, equipment and workmanship provided by manufacturers, fabricators, suppliers and subcontractors. The Contractor shall review each submittal for contract compliance. Submittals that comply will be forwarded to the Government. Submittals that do not conform will be returned to the originator to be corrected. The Submittal Register (ENG Form 4288) will be utilized to log and monitor all submittal activities. No construction or installation activities shall be performed prior to required approvals of applicable submittals. The Contractor shall perform a check to assure that all materials and/or equipment have been tested, submitted and approved during the preparatory phase of quality control inspections.

1.2 SUBMITTAL IDENTIFICATION (SD)

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

In addition, the following items are included:

Work plan
Quality control plan

Permits

SD-02 Shop Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts,

instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accordance with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports

Daily checklists

Final acceptance test and operational test procedure

SD-07 Certificates

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product,

system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

Data intended to be incorporated in operations and maintenance manuals.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

In addition, the following items are included:

As-built drawings

Special warranties

Posted operating instructions

Training plan

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings." All submittals noted in the technical specifications and Submittal Register as "G-DO", "G-AE" or "G-AO" are subject to Government Approval.

1.3.2 Information Only (FIO)

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. The Contracting Officer has the

option to review any submittal.

1.3.3 Administrative Submittals

The submittal items listed below are not be included on the Submittal Register (as discussed below). Unless directed otherwise by the Contracting Officer, the following administrative submittals shall be submitted to the Area or Resident (as directed) Office, for approval, via a Serial Letter: Quality Control Plans (Section 01451A CONTRACTOR QUALITY CONTROL), Accident Prevention Plans (Section 01400 SPECIAL SAFETY REQUIREMENTS, Environmental Protection Plans (Section 01355 ENVIRONMENTAL PROTECTION) and other submittals as directed by the Contracting Officer. Format for the Serial Letter shall be as directed by the Area or Resident Office.

1.4 APPROVED SUBMITTALS

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

1.5 DISAPPROVED SUBMITTALS

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

1.6 WITHHOLDING OF PAYMENT

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

1.7 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves;

test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER

At the end of this section is a submittal register (submittal form) showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The attached submittal register identifies only the submittal section, type of submittal, description of item submitted, paragraph number related to submittal item (section submittal paragraph if none listed), submittal classification (G), and submittal reviewer identifier (DO, AE or AO). Any submittal without a submittal classification and submittal reviewer identifier is considered to be For Information Only (FIO). The submittal register generated by the Government Resident Management System (RMS) Software is used for tracking construction submittals and is referred to as ENG Form 4288 (RMS). The Contractor shall maintain an ENG Form 4288 (RMS) for the project in accordance with the attached ENG Form 4288 (RMS) Instructions. The Contractor will be furnished one (1) set of ENG Forms 4288 (RMS) at the preconstruction conference. Much of the same information contained on the atttached submittal register will be included on the ENG Forms 4288 (RMS) furnished to the Contractor. The Contractor shall complete the appropriate columns as indicated on the attached ENG Form 4288 (RMS) Instructions and return to the Contracting Officer for approval within 20 calendar days after the preconstruction conference. The ENG Form 4288 (RMS)will become a part of the contract after approval. The TRANSMITTAL NUMBER AND ITEM NUMBER shall be left blank for use later to record the respective transmittal and item number corresponding to those listed on the transmittal form entitled: "TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE" (ENG Form 4025). The approved ENG Form 4288 (RMS) will become the scheduling document and will be used to control submittals throughout the life of the contract. The ENG Form 4288 (RMS) and the progress schedules shall be coordinated.

1.9 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 20 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

1.10 TRANSMITTAL FORM (ENG FORM 4025)

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

contract drawings pertinent to the data submitted for each item.

1.11 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.11.1 Procedures

1.11.1.1 "G-DO" or "G-AE" Submittals

All items listed as "G-DO" or "G-AE" submittals in the various sections or on the Submittal Register shall be mailed directly to the addressee shown below as directed. For each submittal, a completed information copy of the attached transmittal form shall also be mailed to the Area Engineer .

An additional copy of "G-D0", "G-AE" or "G-AO" submittals related to fire protection/detection systems shall be submitted to the Base Civil Engineering Office. The mailing address for these submittals shall be obtained at the preconstruction conference.

Technical Reviewer

Engineering Division (DO)
Attn: CENWO-ED-DI
U.S. Army Engineer District, Omaha
106 South 15th Street
Omaha, NE 68102-1618

Each required submittal which is in the form of a drawing shall be submitted as seven (7) prints of the drawing. Drawing prints shall be either blue or black line permanent-type prints on a white background or blueprint and shall be sufficiently clear and suitable for making legible copies.

All catalog and descriptive data shall be submitted in seven (7) copies. Catalog cuts and other descriptive data which have more than one model, size, or type or which shows optional equipment shall be clearly marked to show the model, size, or type and all optional equipment which is proposed for approval. Submittals on component items forming a system or that are interrelated shall be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function as a unit.

1.11.1.2 "G-AO" and FIO Submittals

Except as noted below, data for all items listed as "G-AO" Submittals in the various sections shall be submitted in five (5) copies to the Area Engineer using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed) accompanied by five (5) copies of the transmittal form.

Except as noted below, data for all items listed as FIO Submittals in the various sections shall be submitted in three (3) copies to the Area Engineer using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed) accompanied by three (3) copies of the transmittal form. The Government has the option to review any FIO submittal.

1.11.1.3 Certificates of Compliance

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.

1.11.1.4 Purchase Orders

Copies of purchase orders shall be furnished to the Contracting Officer when the Contractor requests assistance for expediting deliveries of equipment or materials, or when requested by the Contracting Officer for the purpose of quality assurance review. Each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project shall (1) be clearly identified with the applicable DA contract number, (2) carry an identifying number, (3) be in sufficient detail to identify the material being purchased, (4) indicate a definite delivery date, and (5) display the DMS priority rating, if applicable.

1.11.1.5 Operation and Maintenance Instructions and/or Manuals

Where required by various technical sections, operations and maintenance instructions and/or manuals with parts lists included shall be provided by the Contractor in quintuplicate, unless otherwise specified, and shall be assembled in three-ring binders with index and tabbed section divider and having a cover indicating the contents by equipment or system name and project title and shall be submitted for approval to the Contracting Officer 90 days prior to final tests of mechanical and electrical systems, unless otherwise specified. Each operation and maintenance manual shall contain a copy of all warranties and a list of local service representatives required by Section 01200 Warranty of Construction. If field testing requires these copies to be revised, they shall be updated and resubmitted for approval within 10 calendar days after completion of tests. The Operations and Maintenance Instructions and/or Manuals shall be shown as a separate activity on the Contractor prepared construction schedule bar chart or network analysis system.

1.11.2 Deviations

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

1.12 CONTROL OF SUBMITTALS

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

1.13 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated.

1.13.1 "G-AE" or "G-DO" Submittals

The drawing print and five (5) sets of all catalog data and descriptive literature and drawing prints will be retained by the Contracting Officer and two (2) sets of catalog data and descriptive literature and drawing prints will be returned to the Contractor.

1.13.2 "G-AO" Submittals

Two (2) copies of "G-AO" submittals for approval will be returned to the Contractor except for samples, test cylinders, and O&M manuals for which two (2) copies of the transmittal form only will be returned to the Contractor.

1.14 INFORMATION ONLY SUBMITTALS

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

1.15 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following. The stamp shall be affixed and filled out on the back of each ENG Form 4025.

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheets(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

INSTRUCTIONS
ENG FORM 4288 (RMS)

1. The Contractor shall utilize the ENG Form 4288 (RMS) generated by the Government Residential Management System (RMS)software for tracking construction submittals. The Submittal Register information, columns (c) thru (f) from the Submittal Forms furnished with this solicitation, [will be utilized by the Government] to generate the ENG Form 4288 (RMS). [The Government will furnish the Contractor a hard copy of the ENG Form 4288 (RMS) at the preconstruction conference.]. The ENG Form 4288 (RMS) includes the following items and parties responsible for completing the information required on the ENG Form 4288 (RMS). The subparagraph headings below do not correspond to the Submittal Register column headings.

a. Activity Number: will be provided by the Contractor from his Network Analysis, if required, and when a network analysis is accepted.

b. Transmittal Number and Item Number: will be provided by the Contractor from ENG Form 4025 for each item.

c. Specification Paragraph Number: will be provided by the Government from the Submittal Register from column entitled "Specification Paragraph Number".

d. Description of Submittal: will be provided by the Government from the Submittal Register from column entitled "Description of Item Submitted".

e. Type of Submittal: will be provided by the Government from the Submittal Register from column entitled "Type of Submittal" or "Description of Item Submitted".

f. Classification: will be provided by the Government from the Submittal Register from column entitled "Classification".

g. Reviewing Office - Reviewer: will be provided by the Government from the Submittal Register from column entitled "Classification" or "Reviewer".

h. Contractor Schedule Dates: the Contractor will provide schedule dates for

"Submit Needed By" (Date the Contractor expects to submit an item. It is the Contractors responsibility to calculate the lead time needed for the government approval. Note if resubmittal is required it is the Contractors responsibility to make all adjustments necessary to meet the contract completion date.)

"Approval Needed By" (date the Contractor can receive approval and still obtain the material by need date.), and

"Material Needed By" (date that the material is needed at the site. If there is a network analysis it should reflect that date on the analysis.)

i. Contractor Action: Includes the following items: "Code" and "Submit to the Corps". These items will be completed by the Contractor. The action codes will be one of the following:

A - Approved as submitted.

B - Approved, except as noted.
G - Other (specify)

j. Government Action: This item includes a Government Action "Code" and "Date" and is reserved for Government use. The Government reserves the right to review any submittal for contract compliance. Receipt of an Action Code "F - Receipt Acknowledged" or failure of the Contractor to receive an Action Code by the Government, does not mean that the submittal is in compliance with the contract requirements. When used by the Government, the action code will be one of the following:

A - Approved as submitted.
B - Approved except as noted on drawings.
C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.
D - Will be returned by separate correspondence.
E - Disapproved (See Attached).
F - Receipt Acknowledged.
Fx - Receipt acknowledged, does not comply as noted with contract requirements.
G - Other (specify).

2. Reviewer Abbreviation code will be as follows;

G-DO, G-AE or G-AO - Government Approved
For Information Only - Any submittal without a Government Approved abbreviation code.

INSTRUCTIONS
ENG FORM 4025

1. DATE at the top of form will be the date submitted to the Government which is to be completed by the Contractor.

2. TRANSMITTAL NO. Each new transmittal (i.e. [G-AE,] [G-DO,] G-AO or FIO) shall be numbered consecutively for each specification section in the space provided in "Transmittal No.". This number will be the identifying symbol for each submittal. Example: "15400A-001", "15895A-001" "15895A-002", "16415A-001", etc. For each new submittal or for a resubmittal, the appropriate box must be marked. Resubmittals must be designated by their original sequential number followed by an ".1", ".2", etc. for each sequential resubmittal. Example: "15895A-001.1" (previous submittal No. 15895A-001).

3. TO: Box will contain the name and address of the office which will review the submittal (as designated by the Contracting Officer).

4. FROM: Box will be the name and address of the Contractor. Contractor is to complete this box.

5. CONTRACT NO. box will contain the Contractors construction contract number (e.g., DACXXX-XX-C-XXXX).

6. CHECK ONE box

a. CHECK ONE box (for transmittal/ retransmittal) will be completed by the Contractor with one box marked. If a resubmittal is provided last transmittal number will be added.

b. CHECK ONE box will be completed by the Contractor with one box marked for the submittal type.

7. SPECIFICATION SECTION NO. box will be completed by the Contractor. The number will be the five digit number found in the specifications. No more than one section will be covered with each transmittal.

8. PROJECT TITLE AND LOCATION box will be completed by the Contractor.

9. Column a, will be completed by the Contractor and will contain a different number for each item submitted in that transmittal. Once a number is assigned to an item it will remain the same even if there is a resubmittal.

10. Column b, will be completed by the Contractor. The description of each item on this form will be the descriptions provided on the submittal register. The Contractor shall submit each submittal register item all at once on one transmittal if possible. If a submittal register item can not be submitted all at once Contractor should note that in the remarks box.

11. Column c, will be completed by the Contractor. The information will be the appropriate submittal description number as described this Section or shown on the submittal register (e.g. SD-XX).

12. Column d, will be completed by the Contractor. The number of copies will be determined by the Contractor after review of submittal register for the classification of the item and after review of paragraph: SUBMITTAL

PROCEDURES of this Section.

13. Column e, will be completed by the Contractor. The Contractor shall state all applicable paragraph numbers.

14. Column f, will be completed by the Contractor. The Contractor shall state all applicable drawing sheet numbers.

15. Column g, will be completed by the Contractor. The action codes will be one of the following:

A - Approved as submitted.
B - Approved, except as noted.
G - Other (specify)

16. Column h, will be completely by the Contractor. A check shall be placed in this column when a submittal is not in accordance with the plans and specifications also, a written statement to that effect shall be included in the space provided for "Remarks".

17. Column i, is reserved for Government use and may or may not be provided. When used by the Government, the action code will be one of the following:

A - Approved as submitted.
B - Approved except as noted on drawings.
C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.
D - Will be returned by separate correspondence.
E - Disapproved (See Attached).
F - Receipt Acknowledged.
Fx - Receipt acknowledged, does not comply as noted with contract requirements.
G - Other (specify).

18. REMARKS box self explained.

19. Contractor Quality Control Manager must provide name and sign all Eng Form 4025 certifying conformance. In the space for the name and signature, also include a phone number where the CQC Manager may be reached.

20. Section II will be completed by the Government. Contractor is not to write in this space.

See reverse side of ENG Form 4025 for additional instructions.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01200	SD-01 Preconstruction Submittals															
			Proposed Methods of Operation		G	AO												
			Progress Charts	1.13	G	AO												
			Construction Right-of-Way															
			State and Federal Highways	1.8.4														
			State and Local Public Roads	1.8.5														
			SD-02 Shop Drawings															
			Care of Water	1.4	G	AO												
			Traffic Control	1.8.1	G	AO												
			SD-11 Closeout Submittals															
			Warranty of Construction															
		01355A	SD-01 Preconstruction Submittals															
			Environmental Protection Plan	1.7	G	RE												
		01356	SD-07 Certificates															
			Mill Certificate or Affidavit	2.1.3														
		01400	SD-01 Preconstruction Submittals															
			Accident Prevention Plan		G	AO												
			SD-07 Certificates															
			Qualifications		G	AO												
		01568	SD-05 Design Data															
			General Permit Application	3.2.1														
			Stormwater Management Plan	3.1	G	DO												
			Stormwater Management Plan	3.2.2	G	DO												
			Inactivation															
			SD-06 Test Reports															
			Inspection Report	3.2.3														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		02050	SD-01 Preconstruction Submittals																
			Work Plan;		G	AO													
			SD-09 Manufacturer's Field																
			Reports																
			Disposal Facilities;		G	AO													
		02110	SD-03 Product Data																
			Materials Other Than Salable																
			Timber																
		02210	SD-03 Product Data																
			Disposal Facilities		G	AO													
			Statements																
			Field Testing Control																
			SD-09 Manufacturer's Field																
			Reports																
			Field Testing Control																
			Suitable Materials																
		02222	SD-06 Test Reports																
			Disposal Facilities		G	AO													
			Field Density Tests		G	AO													
			Testing of Backfill Material																
		02240	SD-06 Test Reports																
			Gradation Test Results		G	AO													
			Initial Tests		G	AO													
			Waybills and Delivery Tickets																
		02241	SD-03 Product Data																

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02241	Plant, Equipment, Machines, and															
			Tools															
			SD-06 Test Reports															
			Aggregate		G	AO												
			Sampling and Testing															
			Field Density															
		02246	SD-06 Test Reports															
			Initial Sampling and Testing		G	AO												
			Field Gradation		G	AO												
			Stone Protection Report		G	DO												
			Waybills and Delivery Tickets															
		02373	SD-03 Product Data															
			Manufacturing Quality Control		G	DO												
			Manual Sampling and Testing															
			SD-04 Samples															
			Quality Assurance Samples and															
			Tests															
			SD-07 Certificates															
			Geotextile		G	DO												
		02511	SD-06 Test Reports															
			Field Quality Control															
			Concrete															
		02552	SD-03 Product Data															
			Job Mix Formula		G	DO												
			SD-06 Test Reports															
			Moisture-Density Relationship		G	AO												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02552	Certified Refinery Analysis		G	AO												
			Bituminous Surface Course		G	AO												
			Aggregate		G	AO												
		02580	SD-03 Product Data															
			Equipment Lists															
			SD-08 Manufacturer's Instructions															
			Mixing, Thinning and Application															
			SD-06 Test Reports															
			Material Tests															
			SD-07 Certificates															
			Volatile Organic Compound															
			(VOC) Content															
		02720	SD-08 Manufacturer's Instructions															
			Placing Pipe															
			Pipe For Culverts and Storm															
			Drains															
			Resin Certification															
			Pipeline Testing															
			Hydrostatic Test on Watertight															
			Joints															
			Frame and Cover or Gratings															
			Precast Manhole Contrete															
		02915	SD-03 Product Data															
			Equipment															
			SD-05 Design Data															
			Finished Grade and Topsoil	3.2.1														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02915	Underground Utilities															
			Delivered Topsoil	1.6.1														
			Obstructions Below Ground	3.3.1														
			SD-06 Test Reports															
			Soil Test	3.1.4.1														
			Transplanting Plan	1.3														
			SD-07 Certificates															
			Topsoil	2.1														
			Fertilizer															
			Soil Amendment															
			Pesticide	2.5	G AO.													
			SD-08 Manufacturer’s Instructions															
			Application of Pesticide	3.6	G AO													
			Plant Establishment Period	3.8	G AO													
			Maintenance Record		G AO													
			SD-10 Operation and Maintenance															
			Data															
			Maintenance Instructions	3.8.5	G AO													
		02921	SD-03 Product Data															
			Equipment															
			Surface Erosion Control Material	2.7														
			Chemical Treatment Material		G AO													
			Delivery	1.4.1														
			Finished Grade and Topsoil	3.2.1														
			Topsoil	2.2														
			SD-06 Test Reports															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		02921	Equipment Calibration	3.1.3															
			SD-07 Certificates																
			Seed	2.1	G	AO													
			Topsoil	2.2															
			Fertilizer	2.3.1															
			Organic Material	2.3.2															
			Soil Conditioner																
			Mulch	2.4															
			Pesticide	2.6	G	AO													
			SD-04 Samples																
			Delivered Topsoil	1.4.1.1															
			Soil Amendments	2.3															
			Mulch	2.4															
			SD-10 Operation and Maintenance																
			Data																
			Quantity Check	3.5															
			Seed Establishment Period	3.9															
			Maintenance Record	3.9.3.4															
			Application of Pesticide	3.6	G	AO													
		02930	SD-01 Preconstruction Submittals																
			Geotextile	2.5															
			SD-07 Certificates																
			Equipment																
			SD-08 Manufacturer’s Instructions																
			Delivery	1.4.1															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02930	Finished Grade, Topsoil and	3.2.1														
			Underground Utilities															
			Plant Material	2.1														
			Topsoil	2.2														
			Organic Material	2.3														
			Soil Conditioner															
			Organic Mulch	2.4.1														
			Mycorrhizal Fungi Inoculum	2.11														
			Pesticide	2.13	G AO													
			Delivered Topsoil	1.4.1.3														
			Soil Amendments															
			Mulch	2.4														
			Geotextile	2.5														
			Plant Establishment Period	3.9														
			Maintenance Record	3.9.2.5														
			Application of Pesticide	3.7	G AO													
			Maintenance Instructions	3.9.5														
		03100	SD-02 Shop Drawings															
			Concrete Formwork															
			Architectural Formwork		G DO													
			SD-03 Product Data															
			Design		G DO													
			Concrete Formwork		G DO													
			Form Releasing Agents															
		03200	SD-02 Shop Drawings															
			Concrete Reinforcement System		G DO													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03200	SD-07 Certificates															
			Qualifications															
			SD-06 Test Reports															
			Reinforcing Steel;															
		03250	SD-02 Shop Drawings															
			Waterstops		G	AO												
			SD-03 Product Data															
			Preformed Expansion Joint Filler		G	AO												
			Sealant		G	AO												
			Waterstops		G	AO												
			SD-04 Samples															
			Lubricant for Preformed		G	AO												
			Compression Seals															
			Field-Molded Sealant and Primer		G	AO												
			Non-metallic Waterstops and		G	AO												
			Splices															
			SD-07 Certificates															
			Preformed Expansion Joint Filler															
			Sealant															
			Waterstops															
			SD-08 Manufacturer's Instructions															
			Preformed Expansion Joint Filler															
			Sealant															
			Waterstops															
		03301	SD-03 Product Data															
			Graffiti Coating;		G	DO												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03301	Concrete Coloriing		G	DO												
			Mixture Proportions	1.7	G	DO												
			SD-06 Test Reports															
			Testing and Inspection for	3.13	G	AO												
			Contractor Quality Control															
			SD-07 Certificates															
			Qualifications	1.3	G	AO												
			Upstream Channel Mock-up Panel		G	DO												
			Downstream Channel Drop		G	AO												
			Structure Mock-up Panel															
		05055	SD-02 Shop Drawings															
			Detail Drawings		G	DO												
			SD-03 Product Data															
			Miscellaneous Metal Items		G	AO												
			SD-04 Samples															
			Miscellaneous Metal Itmes		G	AO												
			SD-06 Test Reports															
			Quality Control		G	AO												
			SD-07 Certificates															
			Welder Proceedure Qualifications		G	AO												
			Welder, Welding Operator, and		G	AO												
			Tracker Qualifiactions															
			Inspector Qualifications		G	AO												
		16375A	SD-02 Shop Drawings															
			Electrical Distribution System	3.11.3	G	AO												
			As-Built Drawings		G	AO												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Vanbibber Creek

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16375A	SD-03 Product Data															
			Nameplates	2.2	G	AO												
			Material and Equipment	2.1	G	AO												
			General Installation Requirements	3.1	G	AO												
			SD-06 Test Reports															
			Factory Tests		G	AO												
			Field Testing	3.11	G	AO												
			Operating Tests	3.11.13	G	AO												
			Cable Installation	3.2.1.4	G	AO												
			SD-07 Certificates															
			Material and Equipment	2.1	G	AO												
			Cable Installer Qualifications		G	AO												

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

_____

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A -- Approved as submitted.

B -- Approved, except as noted on drawings.

C -- Approved, except as noted on drawings. Refer to attached sheet resubmission required.

D -- Will be returned by separate correspondence.

E -- Disapproved (See attached).

F -- Receipt acknowledged.

FX -- Receipt acknowledged, does not comply as noted with contract requirements.

G -- Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01355A

ENVIRONMENTAL PROTECTION

02/02

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Environmental Pollution and Damage
1.2.2 Environmental Protection
1.2.3 Contractor Generated Hazardous Waste
1.2.4 Project Pesticide Coordinator
1.2.5 Land Application for Discharge Water
1.2.6 Pesticide
1.2.7 Pests
1.2.8 Surface Discharge
1.2.9 Waters of the United States
1.2.10 Wetlands
1.3 GENERAL REQUIREMENTS
1.4 SUBCONTRACTORS
1.5 PAYMENT
1.6 SUBMITTALS
1.7 ENVIRONMENTAL PROTECTION PLAN
1.7.1 Compliance
1.7.2 Contents
1.7.3 Appendix
1.8 PROTECTION FEATURES
1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS
1.10 NOTIFICATION

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS
3.2 LAND RESOURCES
3.2.1 Work Area Limits
3.2.2 Landscape
3.2.3 Erosion and Sediment Controls
3.2.4 Contractor Facilities and Work Areas
3.3 WATER RESOURCES
3.3.1 Cofferdams, Diversions, and Dewatering Operations
3.3.2 Stream Crossings
3.3.3 Wetlands
3.4 AIR RESOURCES
3.4.1 Particulates
3.4.2 Odors
3.4.3 Sound Intrusions
3.4.4 Burning

3.5 MANAGEMENT AND DISPOSAL OF WASTE AND CHEMICAL MATERIALS
3.5.1 Solid Wastes
3.5.2 Chemicals and Chemical Wastes
3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials
3.5.4 Fuel and Lubricants
3.5.5 Waste Water
3.6 RECYCLING AND WASTE MINIMIZATION
3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES
3.8 BIOLOGICAL RESOURCES
3.9 INTEGRATED PEST MANAGEMENT
3.9.1 Pesticide Delivery and Storage
3.9.2 Qualifications
3.9.3 Pesticide Handling Requirements
3.9.4 Application
3.10 PREVIOUSLY USED EQUIPMENT
3.11 MAINTENANCE OF POLLUTION FACILITIES
3.12 MILITARY MUNITIONS
3.13 TRAINING OF CONTRACTOR PERSONNEL
3.14 POST CONSTRUCTION CLEANUP

-- End of Section Table of Contents --

SECTION 01355A

ENVIRONMENTAL PROTECTION
02/02

PART 1 GENERAL

Attachments: Clean Water Action Section 404 Authorization Permit Number 200180586; State of Colorado Section 401 Water Quality Certification Number 2946 permit.
City of Arvada, Colorado, Flood Plain Development Permit.

1.1 REFERENCES

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

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 152 - 186	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual
WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is 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 humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners,excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Project Pesticide Coordinator

The Project Pesticide Coordinator (PPC) is an individual that resides at a Civil Works Project office and that is responsible for oversight of pesticide application on Project grounds.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers,creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G-RE

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or

embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. 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 including methods for protection of features to be preserved within authorized work areas.

i. Drawing showing the location of borrow areas.

j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and the local Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence

of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Project Office specific requirements.

1.7.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached,as an appendix, to the Environmental Protection Plan.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings,plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental 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 the proposed corrective action and take such action when approved by the Contracting Officer. 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 equitable adjustments allowed to the Contractor for any such

suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

This paragraph supplements the Contractor's responsibility under the contract clause "PERMITS AND RESPONSIBILITIES" to the extent that the Government will be responsible for the following environmental permits:

a. Clean Water Action Section 404 Authorization Permit Number 200180586

b. State of Colorado Section 401 Water Quality Certification Number 2946 permit.

c. City of Arvada, Colorado Flood Plain Permit

The Contractor shall comply with the terms and conditions of the attached permits at the end of this section.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 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. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of

the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as specified in Section 01356 STORM WATER POLLUTION PREVENTION MEASURES. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure shall be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. The Contractor shall comply with the State of Colorado water quality standards and anti-degradation provisions and the Clean Water Act Section 404, Nation Wide Permit No. 200180586.

3.3.2 Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments. Construction of stream crossing structures shall be in compliance with Clean Water Act Section 404, Nation Wide Permit No. 200180586.

3.3.3 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands except as authorized herein. The Contractor shall be responsible for the protection of wetlands shown on the drawings in accordance with paragraph ENVIRONMENTAL PERMITS, REVIEWS, AND APPROVALS. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and 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. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Colorado rules.

3.4.4 Burning

Burning will not be allowed on the project site unless specified in other sections of the specifications or authorized in writing by the Contracting Officer. The specific time, location, and manner of burning shall be subject to approval.

3.5 MANAGEMENT AND DISPOSAL OF WASTE AND CHEMICAL MATERIALS

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262 and shall manage and store hazardous waste in accordance with the Project Office hazardous waste management plan. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in

accordance with 40 CFR 279, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work is performed.

3.5.5 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations, or by collecting and placing it in a retention pond where suspended material can be settled out and/or the water can evaporate to separate pollutants from the water. The site for the retention pond shall be coordinated and approved with the Contracting Officer. The residue left in the pond prior to completion of the project shall be removed, tested, and disposed off-Government property in accordance with Federal, State, and local laws and regulations. The area shall be backfilled to the original grade, top-soiled and seeded/sodded. .

b. For discharge of ground water, the Contractor shall surface discharge in accordance with the requirements of the NPDES or State STORM WATER DISCHARGES FROM CONSTRUCTION SITES permit or land apply on the project site. Land application shall be in accordance with all Federal, State, Regional, and/or Local laws and regulations for pumping and land applying ground water.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing shall be land applied in accordance with all Federal, State, and local laws and regulations for land application.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project. .

3.7 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on,

removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Contracting Officer at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the and receive concurrence prior to the application of any pesticide associated with these specifications. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.9.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.9.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.9.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS)shall be available for all pesticide products.

3.9.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests,

noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.13 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.14 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

CENWO-OD-R-CO January 15, 2002

MEMORANDUM FOR CENWO-PM-AP (Mattson)

SUBJECT: Van Bibber Creek Section 205 Section 404 Authorization

FROM: Scott Franklin, Denver Regulatory Office

1. Enclosed is Department of the Army Authorization No. 200180586 for the excavation and placement of fill material into Van Bibber Creek and adjacent wetlands in conjunction with channel work on the creek. The work is located along Van Bibber Creek in the City of Arvada, south of 58th Avenue between Oak Street and Garrison Street. The project is located in Section 9, Township 3 South, Range 69 West, Jefferson County, Colorado.

2. General Condition No. 1 of the authorization establishes the time limit for completing the work. It reflects a construction period of 3 years from the date of issuance of the authorization, **expiring January 31, 2005**.

3. If there are any questions, please call Scott Franklin at (303) 979-4120 and reference File No. 200180586.

Timothy T. Carey
Chief, Denver Regulatory Office

Enclosures

DEPARTMENT OF THE ARMY AUTHORIZATION

Applicant Omaha District, Corps of Engineers

Authorization No. 200180586

Issuing Office Omaha District, Corps of Engineers

NOTE: The term "you" and its derivatives, as used in this authorization, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Authorization Contents:

1. **General Information, signature blocks**
2. **Detailed Description of Authorized Work**
3. **General Conditions**
4. **Special Conditions**
5. **Figures**

Project Location:

The work is located along Van Bibber Creek in the City of Arvada, south of 58th Avenue between Oak Street and Garrison Street, in Section 9, Township 3 South, Range 69 West, Jefferson County, Colorado.

Further Information:

1. **Congressional Authorities**: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. **Limits of this authorization.**

a. This authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This authorization does not grant any property rights or exclusive privileges.

c. This authorization does not authorize any injury to the property or rights of others.

d. This authorization does not authorize interference with any existing or proposed Federal project.

3. **Limits of Federal Liability**. In issuing this authorization, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this authorization.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this authorization.

4. **Reliance on Applicant's Data**: The determination of this office that issuance of this authorization is not contrary to the public interest was made in reliance on the information you provided.

5. **Reevaluation of Authorization Decision**. This office may reevaluate its decision on this authorization at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this authorization.

b. The information provided by you in support of your authorization application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your authorization and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions**. The time limit for completing the work authorized ends on ___**January 31, 2005**___. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this authorization.

_____

Permittee Date

This authorization becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Kurt F. Ubbelohde 1/15/02

Colonel, Corps of Engineers Date
District Engineer

BY: _____
Timothy T. Carey
Chief, Denver Regulatory Office

When the structures or work authorized by this authorization are still in existence at the time the property is transferred, the terms and conditions of this authorization will continue to be binding on the new owner(s) of the property. To validate the transfer of this authorization and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____

Transferee Date

2. DETAILED DESCRIPTION OF AUTHORIZED WORK

In accordance with the terms and conditions of this Department of the Army authorization, US Army Corps of Engineers is granted authorization by the Secretary of the Army to excavate and place fill material into Van Bibber Creek and adjacent wetlands in conjunction with channel work on the creek. Maps and drawings are attached. Issuance of this authorization and the description of the project is based on documents submitted in the original authorization application received by the Denver Regulatory Office.

Sections 313 and 404 of the Clean Water Act (33 .SC. 1323 and 1344) require each agency of the Federal Government engaged in any activity resulting in, or which may result in the discharge or runoff of pollutants, to comply with Federal, State, or interstate and local requirements respecting the control and abatement of water pollution to the same extent as any person or entity is subject to such requirements. In accordance with 33 CFR. 335-337, activities involving the discharge of dredged or fill material to be performed by the Corps of Engineers (Corps) will be subject to public review procedures that are followed in processing applications for Section 404 permits.

2.1. Location

The work is located along Van Bibber Creek in the City of Arvada, south of 58th Avenue between Oak Street and Garrison Street. The project is located in Section 9, Township 3 South, Range 69 West, Jefferson County, Colorado.

2.2. Existing and Future Conditions

Van Bibber Creek from Oak Street to its confluence with Ralston Creek, including the underground conduit, is approximately 6,600 feet. Van Bibber Creek from Oak Street to where it enters the underground pipe about 400 feet east of Kipling Parkway is approximately 3,000 feet. This 3,000-foot length will be manipulated to various extents. The entire length of Van Bibber Creek north of 58th Street between Oak Street and Kipling Parkway, approximately 1,700 feet, will remain in place but will convey only local runoff. According to the proposed plan, normal Van Bibber Creek flows will now flow along an approximately 2,400-foot reach south of 58th Street between Oak Street and Kipling Parkway. The proposed plan for Van Bibber Creek east of Kipling Parkway includes a new underground pipe that will convey flows to Ralston Creek and outlet approximately 600 feet upstream of where it presently outlets. The existing underground pipe will remain in place and will convey the first 5 cfs of flows that flow through Van Bibber Creek. All flows greater than 5 cfs will be conveyed through the new pipe.

2.3. Description of work

The Corps plans to excavate and place fill material into Van Bibber Creek in conjunction with proposed channel improvements and construction of an underground conduit at its confluence with Ralston Creek. Construction of the new channel (with natural vegetative lining and riprap protection where velocities exceed vegetative lining limits) will occur along the reach south of 58th Avenue between Oak Street to Garrison Street. The Oak Street culvert will be modified. A combination drop and transition structure will be constructed at the lower end of the channel to tie into a new underground conduit. The underground conduit will be approximately 1420 feet in length and will connect to Ralston Creek. Channel improvements will be made on existing channels. A stilling basin will be constructed at the conduit outlet that discharges into Ralston Creek. Finally, a flow splitting and drop structure will be constructed immediately downstream of Kipling Parkway to divert low flows through the existing underground conduit and the new conduit.

2.4. Jurisdiction

Van Bibber Creek and any adjacent fringe wetlands are jurisdictional waters of the US since Van Bibber Creek discharges into Ralston Creek, which flows into Clear Creek, which is a jurisdictional tributary of the South Platte River.

2.5. Purpose

For purposes of definition under Section 404, the basic project purpose is to improve flood control. The overall project purpose is to improve flood control along Van Bibber Creek in the City of Arvada.

2.6. Impacts to and mitigation of Waters of the US

The project area hosts approximately 0.160 acres of wetlands, all of these adjacent to Van Bibber Creek. Of these total delineated wetlands, it is expected that the work will permanently impact approximately 0.119 acres of wetlands. The 0.119 acres of wetlands will be mitigated at a 1:1 ratio by creation of 0.119 acres of wetlands to be constructed concurrent with the channel construction.

The project area hosts approximately 270 trees of various species and sizes, all of these on or adjacent to Van Bibber Creek. The project will destroy 44 trees (16 trees with trunk diameters of 6inches or greater, and 28 trees with trunk diameters less than 6-inches). An attempt will be made to replant with a tree spade any existing trees. Replanting of existing trees to be destroyed will reduce the trees required under the mitigation plan.

The 16 destroyed trees with trunk diameters of 6 inches or greater will be replaced with 20 replacement cottonwood or willow trees with a minimum trunk diameter of 3-inches and 72 replacement willow stake trees with a minimum trunk diameter of 1/2-inches planted at 30-inch on center spacing. No trees will be planted within 40 feet or from the centerline of the pilot channel to eliminate any flowage restrictions.

Each of the 28 destroyed trees with a trunk diameter of less than 6-inches will be replaced with a similar native tree with a minimum trunk diameter of 1 inch. The trees will be planted along the top of the channel bank along the entire project. No trees will be planted within the channel banks to ensure there are no restrictions to flood flows. The majority of the trees will be planted along the south bank to provide additional shading to the Van Bibber Creek low flows. Additionally, many of the trees will be planted within the Ballfield Complex (between Oak Street and Kipling Parkway) along the top of the south bank.

The proposed wetland mitigation area is located immediately downstream of the Oak Street bridge, north of the new channel, and south of 58th Avenue in a triangular area within the project boundaries. The wetland area will require additional excavation within the triangular area to lower the ground surface to the level of the pilot channel overbank. The wetland mitigation area will be 0.119 acres.

A grouted stone boulder drop structure (4-foot-drop) will be placed immediately downstream of the Oak Street bridge. Only the bottom 2-4 inches of the 3 ½-foot depth of the boulder layer will be grouted. Half way down the drop, the grout level will be raised approximately 12 inches to form a diagonally downward trough that will channel low flows toward a wetland channel that will circle the wetland area and reenter the channel approximately 200 feet downstream. Higher flows will simply overflow the raised grout level and continue down the drop structure to the pilot channel. The wetland channel will be constructed of 8 to 12-inch diameter rock. The water will flow through this riprap channel and will permeate into the adjacent wetland soils. The wetlands created between this permeating wetland channel and the main pilot channel will be created with soils removed from areas within the project where wetland soils are to be destroyed. The excavated wetland soils will be excavated and directly placed on the new area or stockpiled first and placed following grading of the new wetland area. The wetland area will be over-excavated 12-inches and a 12-inch layer of wetland soils will be placed. Several low areas will be constructed to establish greater plant diversity within the wetland area. Higher mounds will be constructed around several replacement cottonwood trees to be planted in the wetland area. The slopes will be graded upward away from the wetland area at mild slopes varying from 6:1 to 8:1 slope. Three 9-foot-long openings will be created in the currently planned pilot channel boulder toe to allow some relief drainage to the wetland soils and to also provide wetland soil permeation from any sustained flows in the pilot channel.

It is anticipated that the existing wetland soils will contain wetland plant seed that will continue to grow and

to establish new plant growth. If plant growth is not established after the first year, additional wetland plants or plugs such as Rabbit Foot, Teasel, Dock, Hemlock, Willow-herb, Sedges, Fescue or Smartweed will be planted.

3. GENERAL CONDITIONS

1. The time limit for completing the work authorized ends on ___January 31, 2005___. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this authorization in good condition and in conformance with the terms and conditions of this authorization. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this authorization from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this authorization, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this authorization, you must obtain the signature of the new owner in the space provided and forward a copy of the authorization to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this authorization. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your authorization.

7. All construction debris will be disposed of on land in such a manner that it cannot enter a waterway or wetland.

8. Equipment for handling and conveying materials during construction shall be operated to prevent dumping or spilling the materials into the water except as approved herein.

9. Care will be taken to prevent any petroleum products, chemicals, or other deleterious materials from entering the water.

10. Steps will be taken to prevent materials spilled or stored on shore from washing into the water as a result of cleanup activities, natural runoff, flooding, and that, during construction, any materials which are accidentally spilled into the water will be retrieved.

11. All work in the waterway will be performed in such a manner so as to minimize increases in suspended solids and turbidity which may degrade water quality and damage aquatic life outside the immediate area of operation.

12. All areas along the bank disturbed or newly created by the construction activity will be seeded with vegetation indigenous to the area for protection against subsequent erosion.

13. The clearing of vegetation will be limited to that which is absolutely necessary for construction of the project.

14. Close coordination will be maintained by the contractor with downstream water users, advising them of any water

quality changes to be caused by the construction.

15. All dredged or excavated materials, with the exception of that authorized herein, will be placed on an upland site above the ordinary high water line in a confined area, not classified as a wetland, to prevent the return of such materials to the waterway.

16. Deposition of excavated materials on shore and all earthwork operations on shore will be carried out in such a way that sediment runoff and soil erosion to the water are controlled.

17. Adequate pipes shall be installed in any temporary crossing to carry normal flows and prevent the restriction of expected high flows during construction.

18. Concrete trucks will be washed at a site and in such a manner that washwater cannot enter the waterway.

19. The use of machinery in the waterway will be kept to a minimum.

20. When the District Engineer has been notified that a filling activity is adversely affecting fish or wildlife resources or the harvest thereof and the District Engineer subsequently directs remedial measures, the permittee will comply with such directions as may be received to suspend or modify the activity to the extent necessary to mitigate or eliminate the adverse effect as required.

21. Fuel storage tanks above ground shall be diked or curbed or other suitable means provided to prevent the spread of liquids in case of leakage in the tanks or piping.

4. SPECIAL CONDITIONS

A. The Colorado Department of Health issued Section 401 Colorado Water Quality Certification Number 2946on December 10, 2001, in accordance with Section 401 of the Clean Water Act. The permittee agrees to comply with Certification Number 2907, the requirements from which are attached to, and made a part of, this authorization. The water quality certification is shown on Figs. 19-23.

B. There are numerous large and mature trees in the existing Van Bibber channel north of 58th Street. Although Van Bibber flows will cease through this reach upon completion of the project, the channel will remain to convey local runoff and it is expected that trees will not be impacted. However, to make sure they survive, the trees will be monitored for three years after Van Bibber flows are diverted. If any tree dies, it will be replaced somewhere on the Van Bibber channel with a 2-inch diameter willow or cottonwood.

C. Mitigation will be accomplished in accordance with the mitigation plan and according to these special conditions.

D. There will be no mowing, spraying or other detrimental maintenance of the mitigation areas.

E. Mitigation will be considered successful when at least 85 percent of the mitigation site consists of wetland plants.

F. Once the mitigation areas have been constructed and planted, proper precautions will be taken to prevent domestic animals and human activity from adversely affecting them.

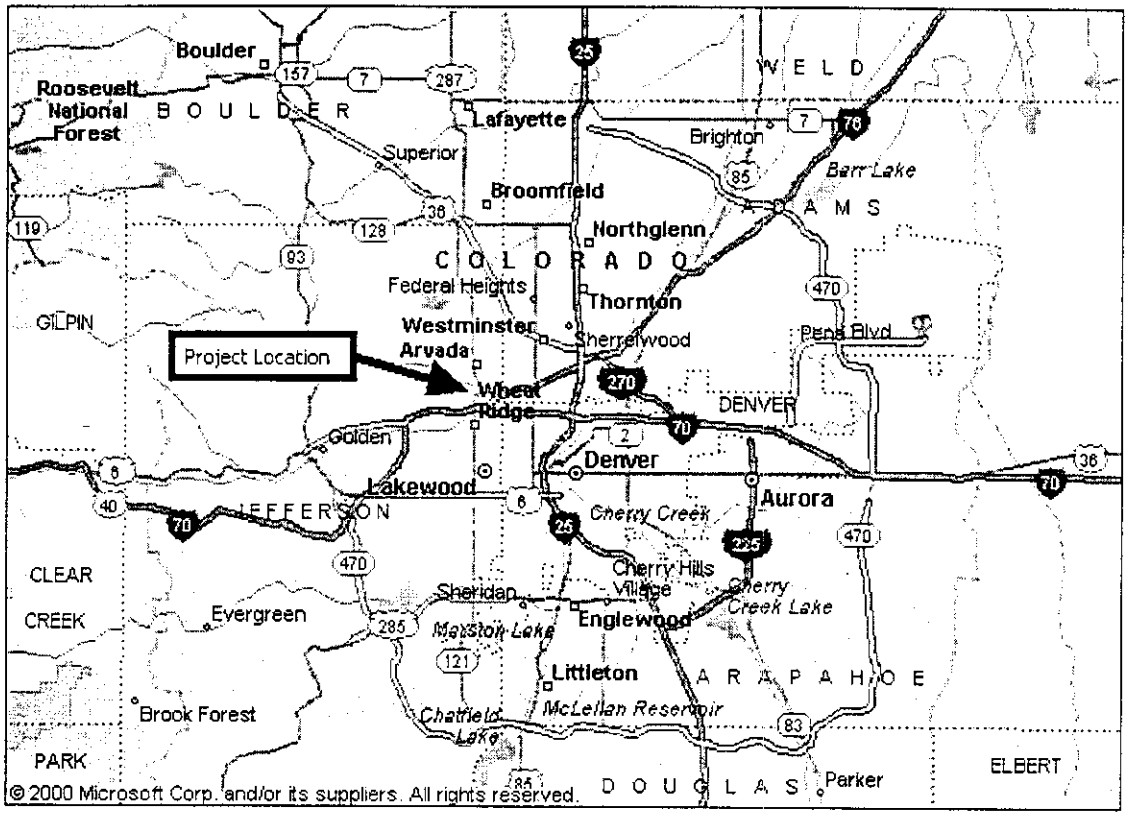
G. The mitigated wetlands will be monitored by the applicant each year beginning in 2003 until the Corps of Engineers determines them to be viable and self-sustaining. **Annual Mitigation Progress Reports** will be submitted to the Denver Regulatory Office before December 31 of each year beginning in 2003. These reports will include but **not** be limited to:

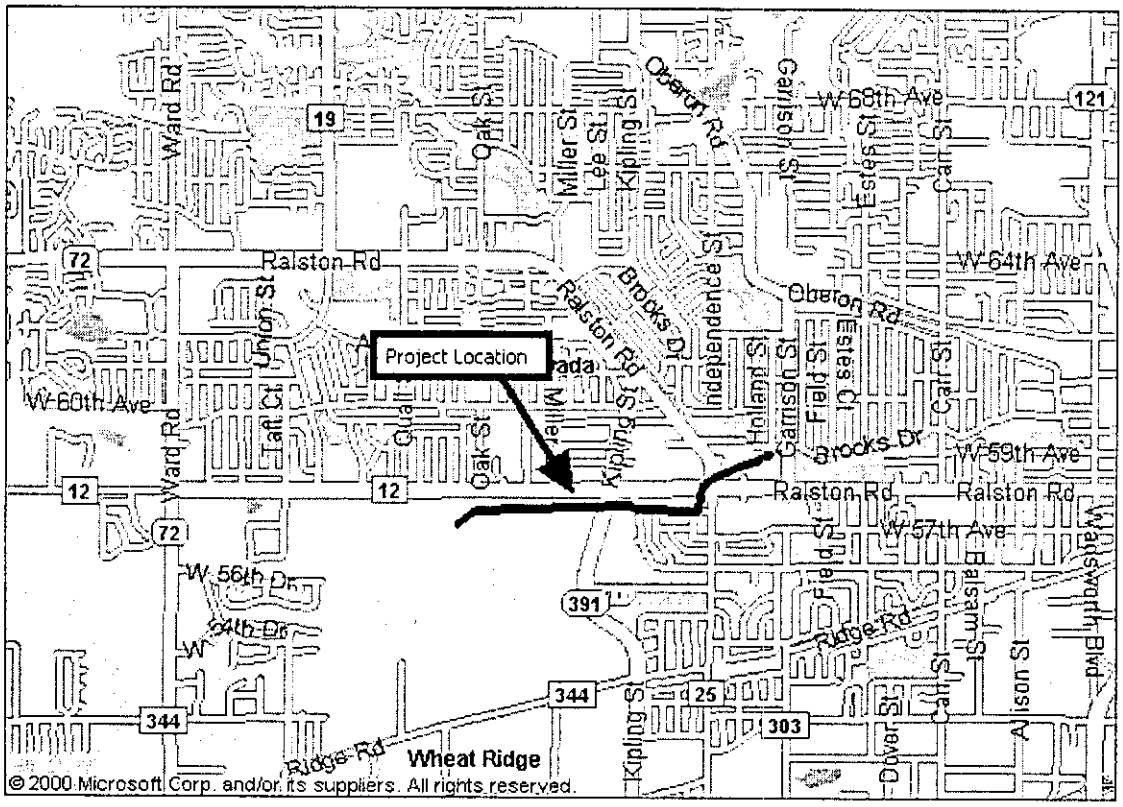
- authorization number and county where the project is located;
- a discussion of successes, failures, and problems;
- percent of ground surface area that is vegetated, percent of the vegetated area that contains wetland species, list of prevalent plant species;
- maps, and drawings as needed for illustration; and
- photographs of mitigation area (to be taken from the same location each year and submitted with each report).

If during the first three years after initial implementation of mitigation the site conditions indicate that the success criteria are not likely to be achieved, remedial efforts will be undertaken after consultation with the Corps of Engineers.

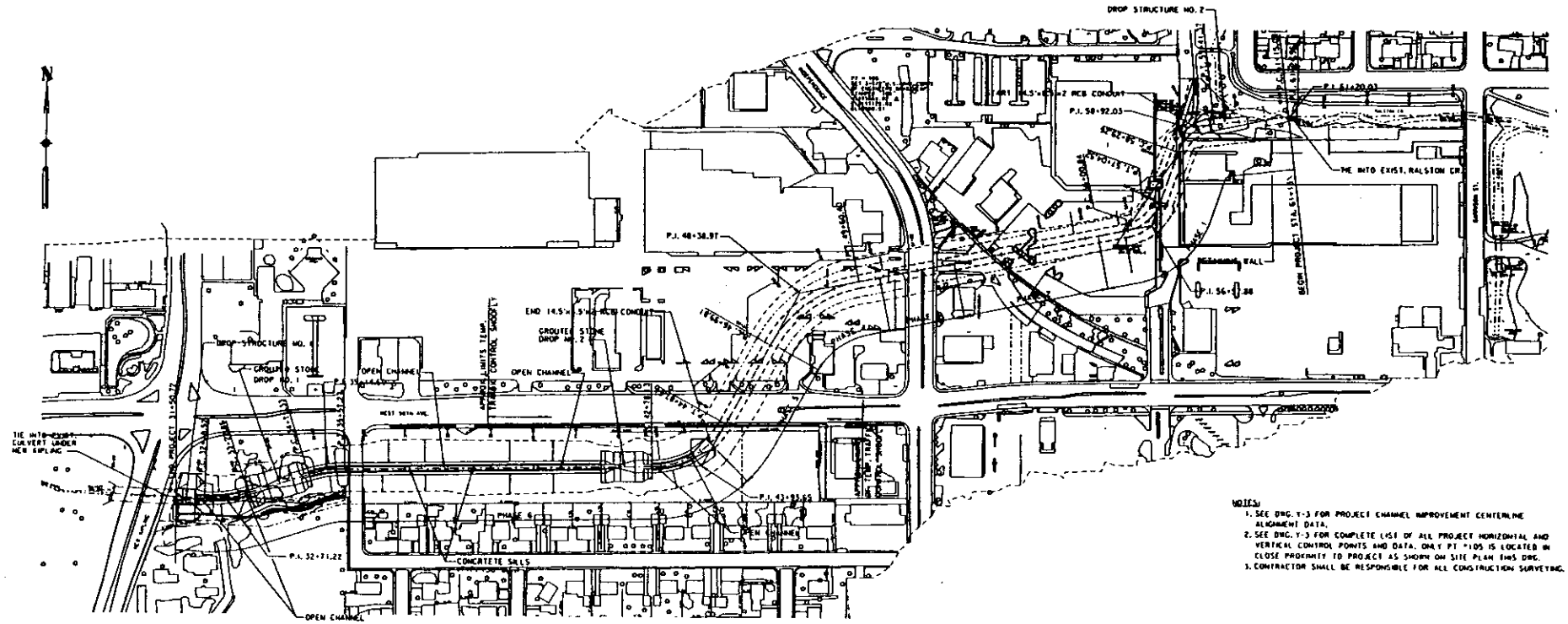
H. After a detailed and careful review of all of the conditions contained in this authorization, the permittee acknowledges that, although said conditions were required by the Corps of Engineers, nonetheless the permittee agreed to those conditions voluntarily to facilitate issuance of the authorization; the permittee will comply fully with all the terms of all the authorization conditions.

Location Maps





Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 1

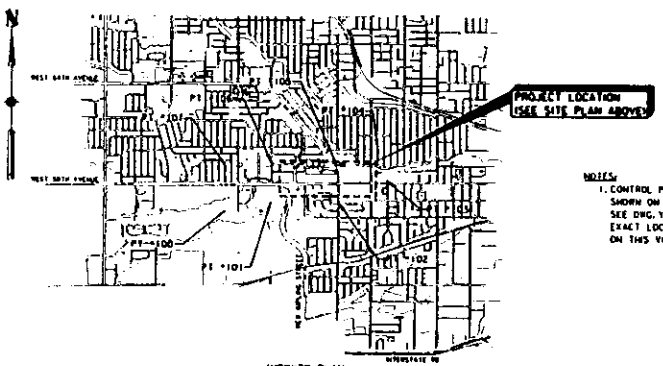


NOTES:
1. SEE DWG. Y-3 FOR PROJECT CHANNEL IMPROVEMENT CENTERLINE ALIGNMENT DATA.
2. SEE DWG. Y-3 FOR COMPLETE LIST OF ALL PROJECT HORIZONTAL AND VERTICAL CONTROL POINTS AND DATA. ONLY PT #105 IS LOCATED IN CLOSE PROXIMITY TO PROJECT AS SHOWN ON SITE PLAN THIS DWG.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION SURVEYING.

SITE PLAN

SCALE: 1 INCH = 100 FEET

Segment 1 - Reach Downstream of New Kipling Avenue



VICINITY PLAN

SCALE: 1 INCH = 2000 FEET

NOTES:
1. CONTROL POINTS PT #100 THROUGH PT #107 SHOWN ON THIS MAP FOR GENERAL INFORMATION ONLY. SEE DWG. Y-3 FOR COMPLETE DESCRIPTIONS AND EXACT LOCATIONS OF ALL CONTROL POINTS SHOWN ON THIS VICINITY MAP.

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 2

Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: M. CONSTOCK
Drawn by: J. MAST
Checked by: C. MILLER
Reviewed by: M. ROCH
Submitted by: BURNS & McDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
SITE PLAN

Plot Scale Ratio: 1:1
Design File: MCEADDRVB
Date: January 1998
Spec. No.: DACW 45
Contract No.: DACW 45
Drawing Code: SPV1-220E 2
Sheet Reference Number: Y-2

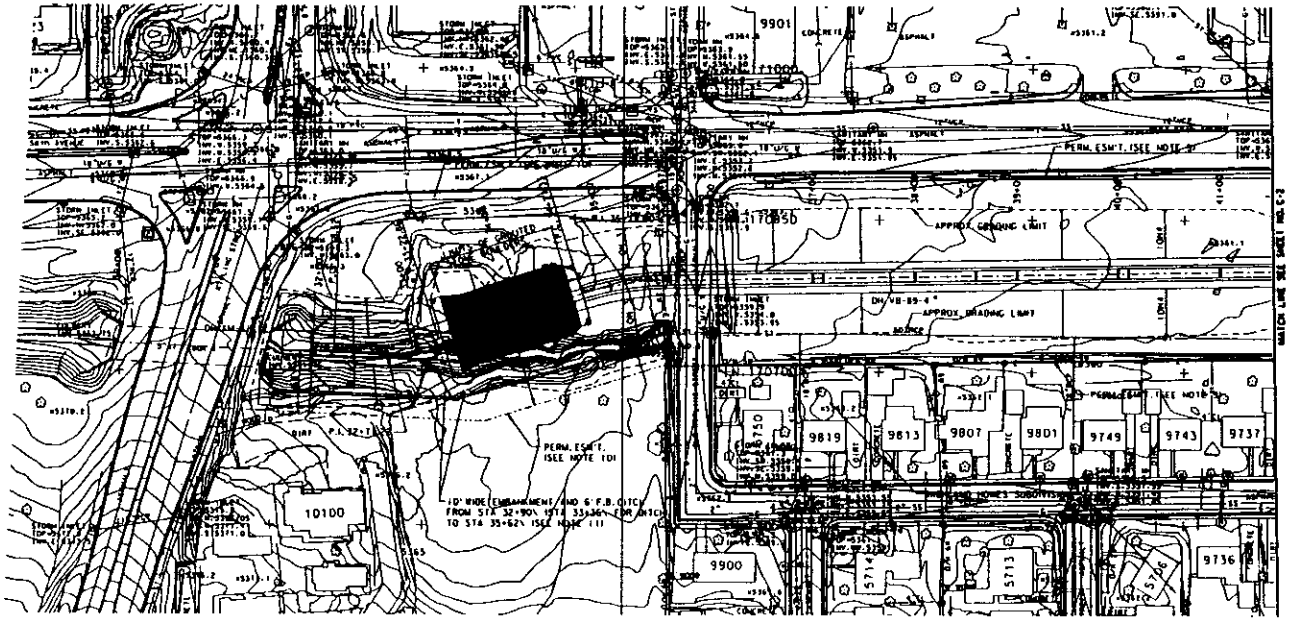
C Initial
A
B Initial
D Initial

NOTES:

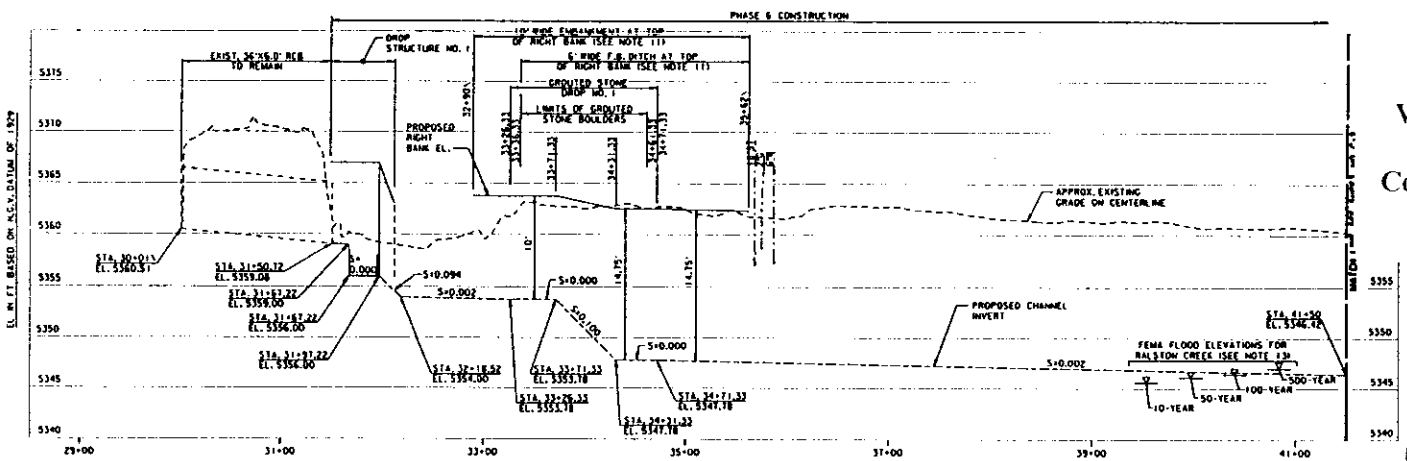
1. FOR CENTERLINE ALIGNMENT & SURVEY REFERENCE DATA, SEE DWG. Y-3.
2. FOR LEGEND, SEE DWG. Y-4.
3. FOR LEGEND OF SUBSURFACE EXPLORATIONS AND LOGS OF BORINGS, SEE DWGS. G-1 THROUGH G-4.
4. FOR TYPICAL SECTIONS, SEE DWGS. C-4 AND C-5.
5. FOR GENERAL PLAN OF UTILITY ADJUSTMENTS AND RELOCATIONS, SEE DWGS. U-1 AND U2.
6. FOR DETAILS OF GROUTED STONE DROP NO. 1, SEE DWG. C-6.
7. FOR DETAIL PLAN BACK OF STA. 41+29, SEE DWG. C-15.
8. FOR DETAILS OF DROP STRUCTURE NO. 1, SEE DWGS. S-8 THROUGH S-10.
9. PERMANENT ESM'T. EAST OF OLD KIPLING EXTENDS FROM SOUTH R/W LINE OF WEST 58TH TO NORTH LINE OF HIGHLAND HOMES SUBDIVISION.
10. PERMANENT ESM'T. WEST OF OLD KIPLING EXTENDS FROM SOUTH R/W LINE OF WEST 58TH AND EAST R/W LINE OF NEW KIPLING TO A LINE 60 FEET TO 90 FEET SOUTH OF PROPOSED PROJECT CENTERLINE (SEE THIS DWG. FOR DIMENSIONS SOUTH OF PROJECT CENTERLINE).
11. WHERE PROPOSED TOP OF CHANNEL BANK IS ABOVE EXIST. GRADE.
12. SEE DWGS. U-1 AND U-2 FOR ALL UTILITY LOCATIONS AND REQ'D RELOCATIONS.
13. APPROX. FEMA FLOOD ELEVATIONS FOR RALSTON CREEK ARE PROVIDED TO MAKE CONTRACTOR AWARE OF POTENTIAL FLOOD ELEVATIONS FROM RALSTON CREEK BACKWATER THAT COULD BE ENCOUNTERED DURING CONSTRUCTION. APPROX. ELEVATIONS ARE 10-YEAR: 5345.8; 50-YEAR: 5346.1; 100-YEAR: 5346.4; 500-YEAR: 5347.0.
14. FOR STORM SEWER MODIFICATIONS/ADDITIONS, SEE DWGS. C-25 THROUGH C-29.

LEGEND

- LIMITS OF GROUTED STONE BOULDERS



PLAN



PROFILE AND UNDERGROUND EXPLORATIONS

SCALE: 1" = 50' HORIZ.

SCALE: 1" = 5' VERT.

Segment 1 - Reach Downstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 3

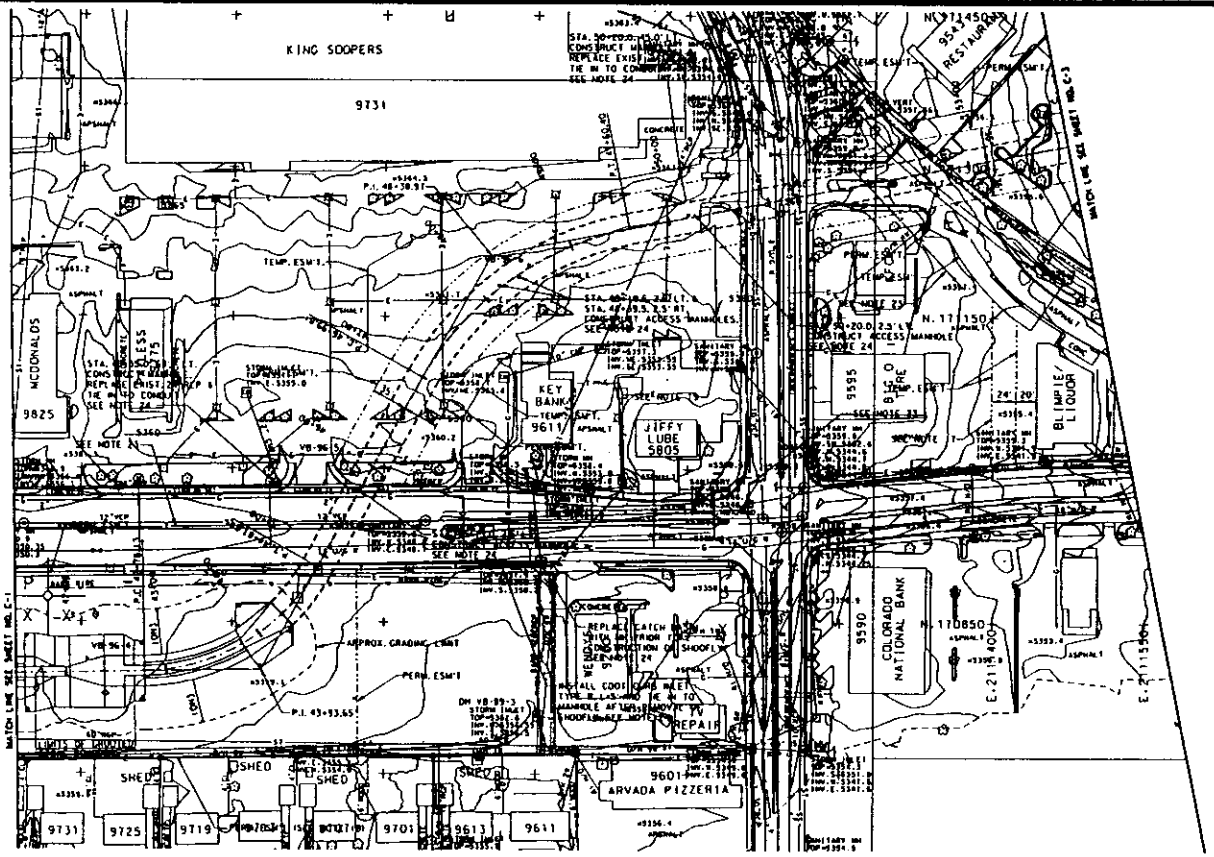
Burns & McDonnell

U.S. ARMY ENGINEER DIST. - MCT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: M. CONSTOCK
Drawn by: J. MAST
Checked by: G. MILLER
Reviewed by: M. KOCH
Submitted by: BURNS & McDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
PLAN, PROFILE AND
UNDERGROUND EXPLORATIONS
STA. 29+00 TO STA. 41+50

Plot Scale Ratio: 10:1
Design File: BFL1200V0
Date: January 1999
Spec. No.: DACW 48
Contract No.: DACW 48
Drawing Code: SPV1-220E 5
Signed reference number: C-1



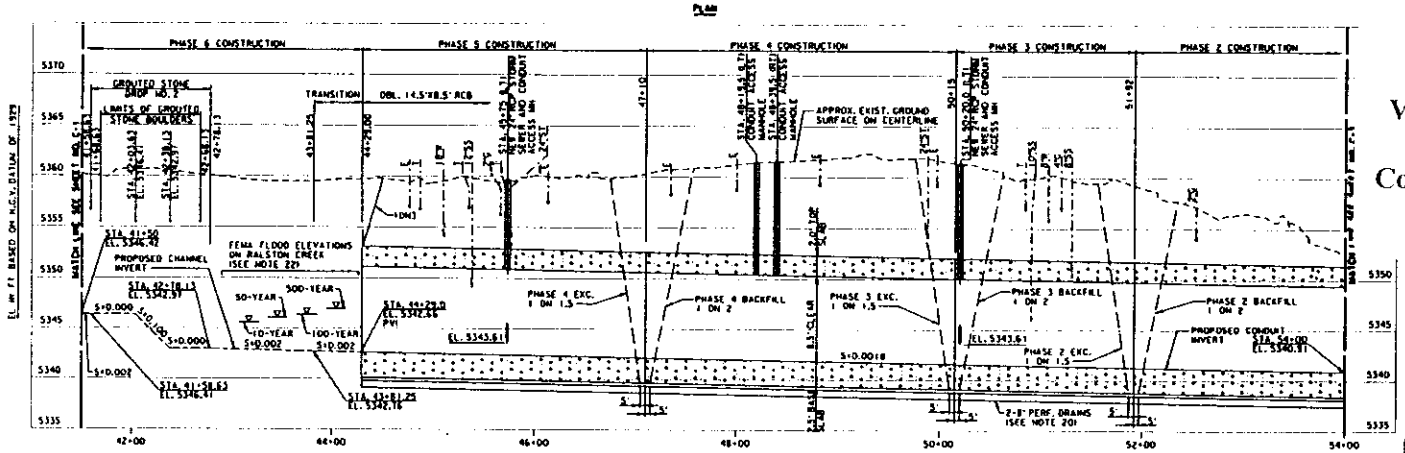
PLAN

NOTES:

1. FOR CENTERLINE ALIGNMENT & SURVEY REFERENCE DATA, SEE DWG. Y-3.
2. FOR LEGEND, SEE DWG. Y-4.
3. FOR LEGEND OF SUBSURFACE EXPLORATIONS AND LOGS OF BORINGS, SEE DWGS. C-1 THROUGH C-4.
4. FOR TYPICAL SECTIONS, SEE DWGS. C-4 AND C-5.
5. FOR GENERAL PLAN OF UTILITY ADJUSTMENTS AND RELOCATIONS, SEE DWGS. U-1 AND U-2.
6. FOR DETAILS OF GROUTED STONE DROP, SEE DWG. C-6.
7. FOR DETAIL PLAN BACK OF STA. 41+29, SEE DWG. C-15.
8. FOR PHASE 5 EXCAVATION AND RESTORATION PLANS, SEE DWG. C-14.
9. FOR PHASE 4 EXCAVATION PLAN, SEE DWG. C-12.
10. FOR PHASE 4 RESTORATION PLAN, SEE DWG. C-13
11. FOR PHASE 3 EXCAVATION AND RESTORATION PLANS, SEE DWG. C-11.
12. FOR PHASE 2 EXCAVATION PLAN, SEE DWG. C-9.
13. FOR PHASE 2 RESTORATION PLAN, SEE DWG. C-10
14. CONSTRUCTION OF A TEMPORARY BYPASS IS REQUIRED FOR MAINTENANCE OF TRAFFIC ON WEST 58TH DURING PHASE 5 CONSTRUCTION, SEE DWGS. C-17 AND C-18.
15. FOR DETAILS OF RCB CONDUIT INLET WINGWALLS AT STA. 44+29, SEE DWG. S-4.
16. FOR DETAILS OF RCB CONDUIT, SEE DWGS. S-2 THROUGH S-4.
17. TEMP. EASEMENT FOR CONSTRUCTION ACCESS, APPLICABLE TO PHASE 2 AND 3 ONLY. CONTRACTOR RESPONSIBLE FOR RESTORING DAMAGED PAVEMENT WITHIN EASEMENT AFTER CONSTRUCTION, SEE DWG. C-10.
18. PERMANENT ESMT. EAST OF OLD KIPLING EXTENDS FROM SOUTH R/W LINE OF WEST 58TH TO NORTH LINE OF HIGHLAND HOMES SUBDIVISION.
19. TEMPORARY EASEMENT FOR CONSTRUCTION ACCESS, APPLICABLE TO PHASE 4 ONLY.
20. SEE TYPICAL SECTION STA. 44+29.0 TO 59+04.0 ON DWG. C-4 FOR DIMENSIONS/PLACEMENT OF DRAIN PIPES.
21. SEE DWGS. U-1 AND U-2 FOR ALL UTILITY LOCATIONS AND REDO. RELOCATIONS.
22. APPROXIMATE FEMA FLOOD ELEVATIONS FOR RALSTON CREEK ARE PROVIDED TO MAKE CONTRACTOR AWARE OF POTENTIAL FLOOD ELEVATIONS FROM RALSTON CREEK BACKWATER THAT COULD BE ENCOUNTERED DURING CONSTRUCTION. APPROXIMATE ELEVATIONS ARE: 10-YEAR/5345.6, 50-YEAR/5346.1, 100-YEAR/5346.4, 500-YEAR/5347.0.
23. THESE UTILITIES ARE FIBER OPTICS LINES. SEE DWGS. U-1 AND U-2 FOR DETAILED RELOCATION INFORMATION.
24. FOR STORM SEWERS MODIFICATIONS/ADDITIONS, SEE DWGS. C-25 THROUGH C-29.

LEGEND

- LIMITS OF GROUTED STONE BOULDERS



PROFILE AND UNDERGROUND EXPLORATIONS

SCALE: 1" = 50' HORIZ.

SCALE: 1" = 5' VERT.

Segment 1 - Reach Downstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 4

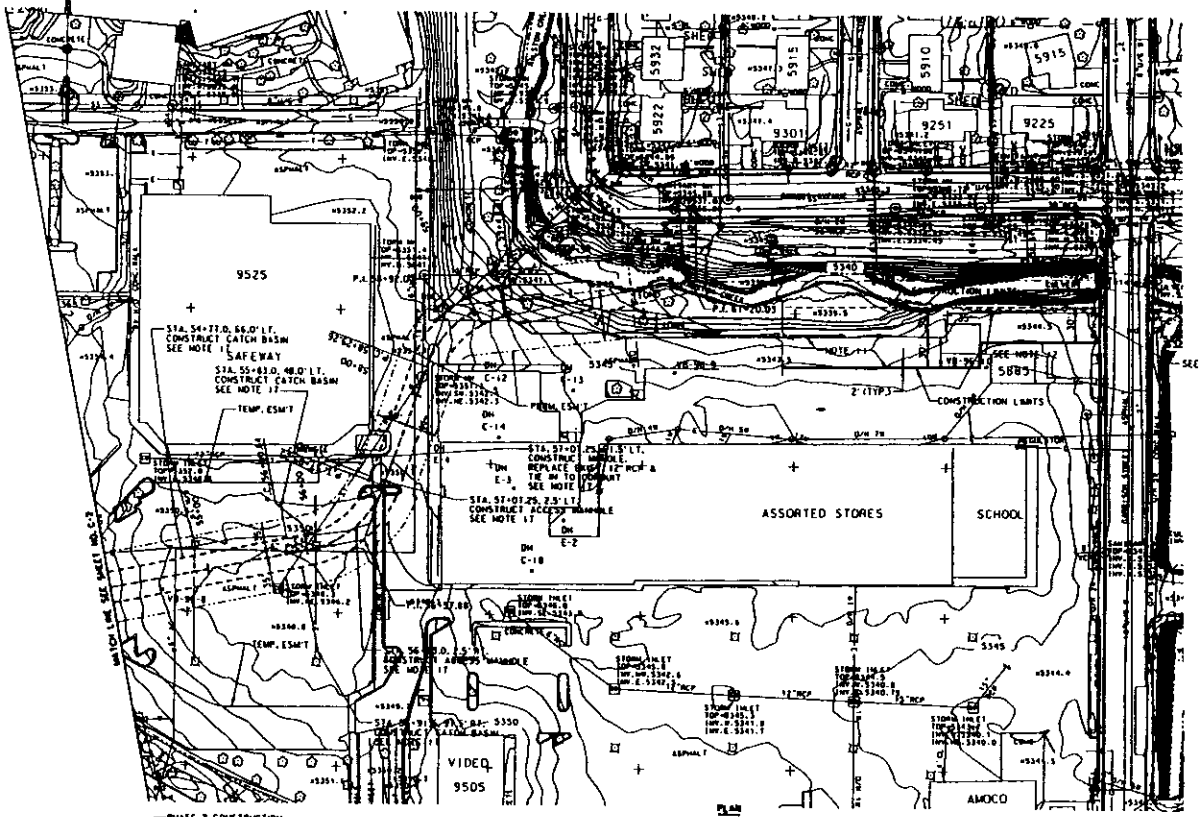
Burns & McDonnell

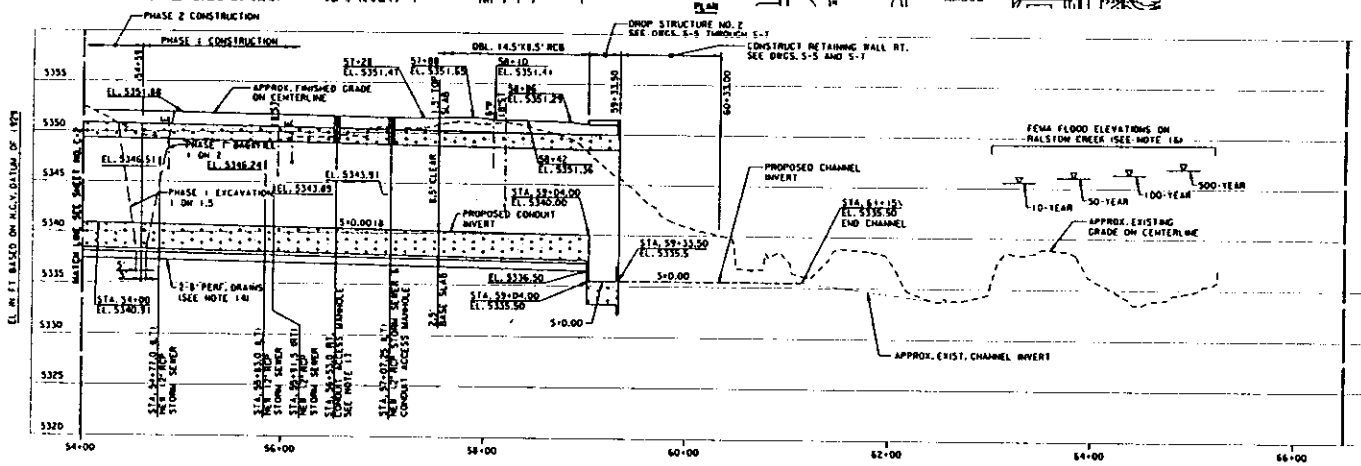
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA

Designed by: M. COMSTOCK
Drawn by: J. WAST
Checked by: G. MILLER
Reviewed by: M. EDER
Submitted by: BURNS & McDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
PLAN, PROFILE AND UNDERGROUND EXPLORATIONS
STA 41+50 TO STA 54+00

Plot Scale Ratio: 1:1
Design File: 8FLEARBREVS
Date: January 1998
Spec. No.: DACW 45
Contract No.: DACW 45
Drawing Code: SPVT-220E 6
Sheet reference number: C-2





NOTES:

1. FOR CENTERLINE ALIGNMENT & SURVEY REFERENCE DATA, SEE DWG. Y-3.
2. FOR LEGEND, SEE DWG. Y-4.
3. FOR LEGEND OF SUBSURFACE EXPLORATIONS AND LOGS OF BORINGS, SEE DWGS. G-1 THROUGH G-4.
4. FOR TYPICAL SECTIONS, SEE DWGS. C-4 AND C-5.
5. FOR GENERAL PLAN OF UTILITY ADJUSTMENTS AND RELOCATIONS, SEE DWGS. U-1 AND U-2.
6. FOR PHASE 1 EXCAVATION PLAN, SEE DWG. C-7.
7. FOR PHASE 1 RESTORATION PLAN, SEE DWG. C-8
8. FOR PHASE 2 EXCAVATION PLAN, SEE DWG. C-9.
9. FOR PHASE 2 RESTORATION PLAN, SEE DWG. C-10
10. FOR DETAILS OF REINFORCED CONCRETE CONDUIT, SEE DWGS. S-2 THROUGH S-4.
11. CONSTRUCTION EASEMENT FOR ACCESS FROM GARRISON ST. APPLICABLE TO PHASE 1 CONSTRUCTION ONLY. INSTALL 4" WHITE SOLID PLASTIC PVM'T MARKING TAPE ALONG CONSTRUCTION LIMIT LINE. CONSTRUCTION DRUMS AT 15' CTRS. AND 4' CONSTRUCTION FENCING SIMILAR TO SECTION "A" ON DWG. C-7
12. REMOVE AND REPLACE EXIST. PAVEMENT AND 6" VERTICAL CURB ALONG NORTH LINE OF EXIST. PARKING LOT.
13. INSTALL TEMPORARY GATE FOR CONTROL OF ACCESS DURING PHASE 1 CONSTRUCTION. FOR TRAFFIC SIGNING VICINITY OF CONSTRUCTION ACCESS, SEE DWG. C-21.
14. SEE TYPICAL SECTION STA. 44+29.0 TO 59+04.0 ON DWG. C-4 FOR DIMENSIONS/PLACEMENT OF DRAIN PIPES.
15. SEE DWGS. U-1 AND U-2 FOR ALL UTILITY LOCATIONS AND REQ'D. RELOCATIONS.
16. APPROXIMATE FEMA FLOOD ELEVATIONS FOR RALSTON CREEK ARE PROVIDED TO MAKE CONTRACTOR AWARE OF POTENTIAL FLOOD ELEVATIONS FROM RALSTON CREEK BACKWATER THAT COULD BE ENCOUNTERED DURING CONSTRUCTION. APPROXIMATE ELEVATIONS ARE: 10-YEAR:5345.6, 50-YEAR:5346.1, 100-YEAR:5346.4, 500-YEAR:5347.0.
17. FOR STORM SEWERS MODIFICATIONS/ADDITIONS, SEE DWGS. C-25 THROUGH C-28.

Segment 1 - Reach Downstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 5

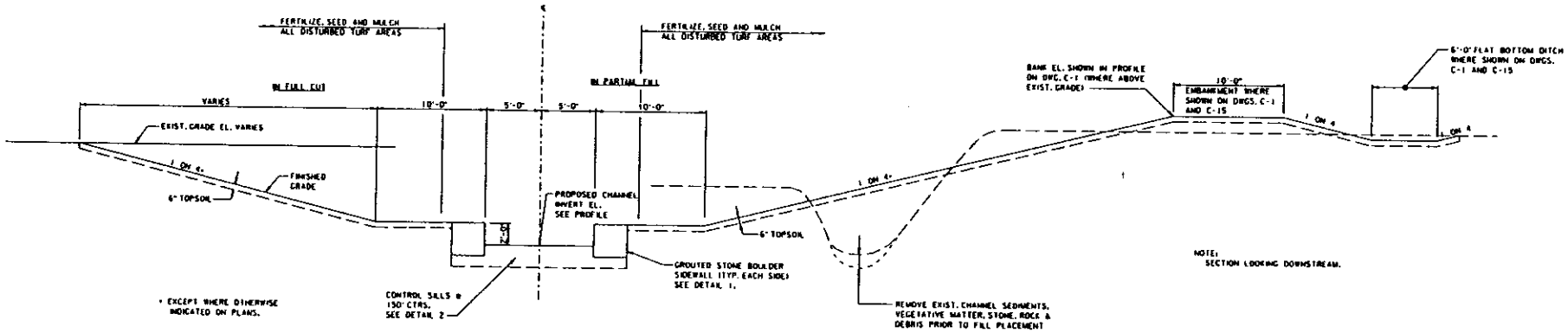
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

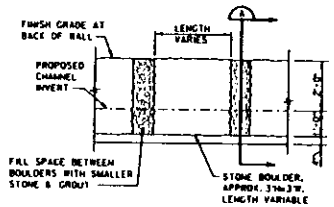
Designed by: M. CONSTOCK
Drawn by: A. MAST
Checked by: G. MILLER
Reviewed by: M. KOCH
Submitted by: BURNS & McDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
PLAN, PROFILE AND
UNDERGROUND EXPLORATIONS
STA. 54+00 TO STA. 61+30

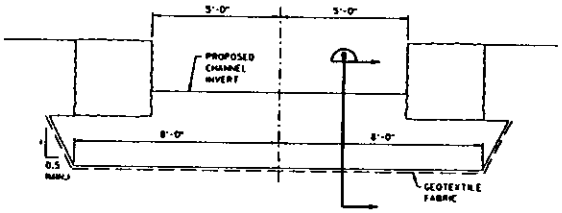
Plot Scale Ratio: 1:1
Design File: PFS_EXPLORATIONS
Date: January 1996
Type No. DACW 45
Contract No. DACW 45
Drawing Code: SPVI-220E 7
Sheet Reference Number: C-3



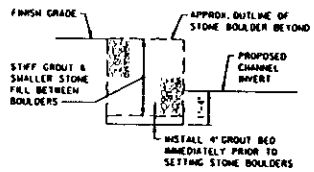
TYPICAL SECTION
STA. 32+38.37 TO STA. 43+81.25
NOT TO SCALE



ELEVATION

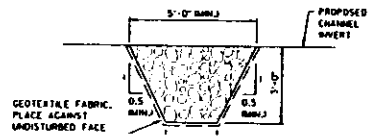


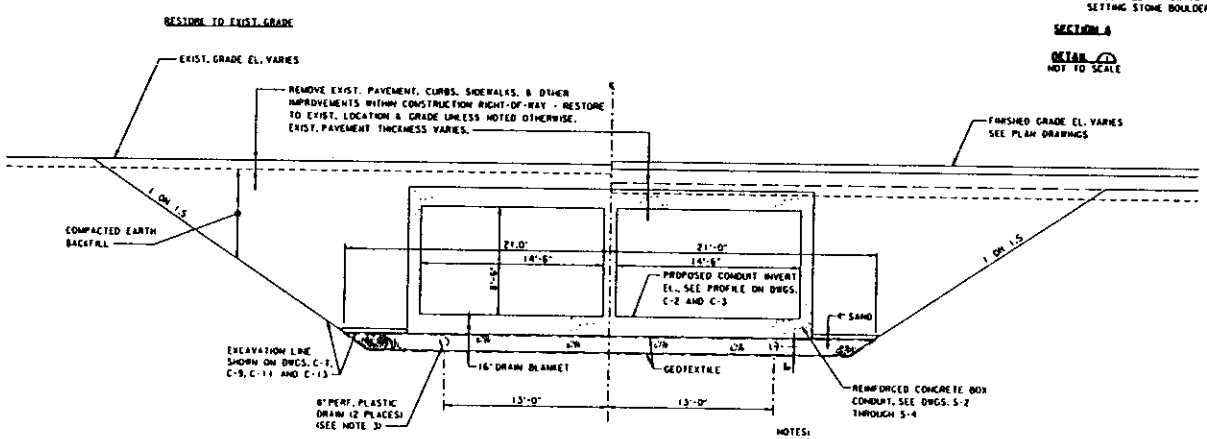
ELEVATION



SECTION A

DETAIL 1
NOT TO SCALE





TYPICAL SECTION
STA. 44+29.0 TO STA. 59+04.0
NOT TO SCALE

NOTES:
1. PERIOD OF TIME BETWEEN INITIAL EXCAVATION AND PLACEMENT OF DRAIN BLANKET SHALL NOT EXCEED 7 DAYS.
2. SECTION LOOKING DOWNSTREAM.
3. 6" PERF. PLASTIC DRAINS TO BE PLACED AT A HORIZONTAL DISTANCE FROM ℄ AS SHOWN, AND ARE TO BE PLACED VERTICALLY CENTERED WITHIN 16" DRAIN BLANKET AS SHOWN. DRAINS SHALL START AT STA. 44+29.0 AND SHALL OUTLET AT STA. 59+04.0 IN CHORALL AT DROP STRUCTURE NO. 2, FOLLOWING LONGITUDINAL SLOPE OF RCB CONDUIT. SEE PROFILE DWG'S. C-2 AND C-3.

Segment 1 - Reach Downstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 6

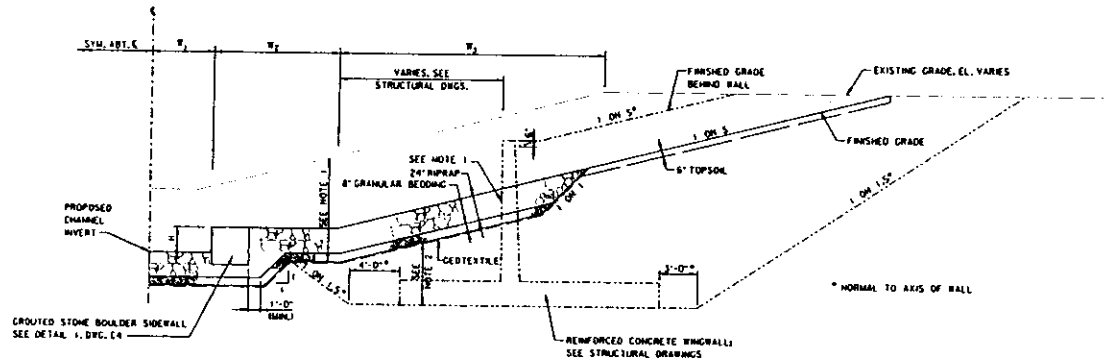
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT

TYPICAL SECTIONS I

Designed by: M. COWSTOCK
Drawn by: J. MAST
Checked by: G. MILLER
Reviewed by: M. FOCH
Submitted by: BURNS & McDONNELL
Plot Scale Range: 10:1
Date: January 1999
Drawing Code: SPVI-220E 8
C-4

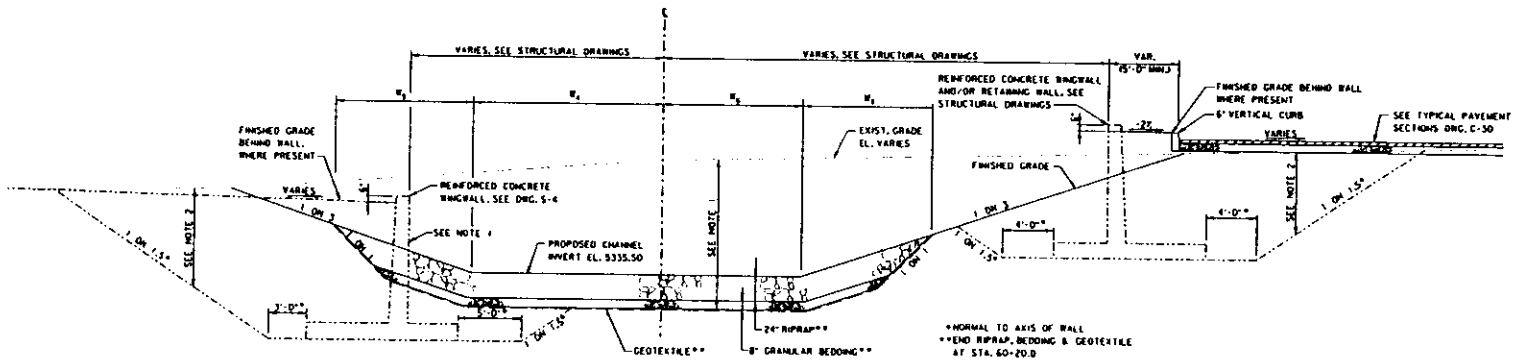


SCHEDULE OF DIMENSIONS (FT.)					
℄ STATION	VAR. DIMENSION IN FT.				SLOPE
	H	W_1	W_2	W_3	S
31+97.22	0.0	5.0	13.8	N.A.	1 ON 4
32+18.52 BA.	2.0	5.0	10.0	20.0	1 ON 4
32+18.52 AHD	2.0	5.0	10.0	20.0	1 ON 4
32+38.52	2.0	5.0	10.0	20.0	1 ON 4
SEE TYP. SECTION DWG. C4 FOR INTERMEDIATE					
43+81.52	2.0	5.0	10.0	15.0	1 ON 3
44+29.0	2.0	15.0	0.0	N.A.	1 ON 3

NOTE:

END RIPRAP BEDDING AND GEOTEXTILE AT FACE OF WALL, WHERE PRESENT. EXTEND TO 1 ON 1 SLOPE WHERE FACE OF WALL IS BEYOND DIMENSION "W_3".

TYPICAL SECTION
STA. 31+97.22 TO STA. 32+38.52
STA. 43+81.52 TO STA. 44+29.0



SCHEDULE OF DIMENSIONS (FT.)				
℄ STATION	W_4	W_5	W_6	W_7
58+53.50	15.0	N.A.	15.0	N.A.
59+41.37	15.0	10.5	15.0	NOTE 2
59+81.37	11.0	10.5	11.0	10.5
59+93.00	11.0	10.5	9.8	10.5
60+20.00	11.0	0.0	7.1	10.5
60+51.00	0.0	N.A.	4.0	N.A.
60+91.37	N.A.	N.A.	0.0	N.A.
61+15.00	MATCH EXISTING			

NOTES:

1. END RIPRAP BEDDING AND GEOTEXTILE AT FACE OF WALL, WHERE PRESENT.
2. ALL SECTIONS LOOKING DOWNSTREAM.

TYPICAL SECTION
STA. 58+53.50 TO STA. 61+15.0

Segment 1 - Reach Downstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 7

Burns & McDonnell

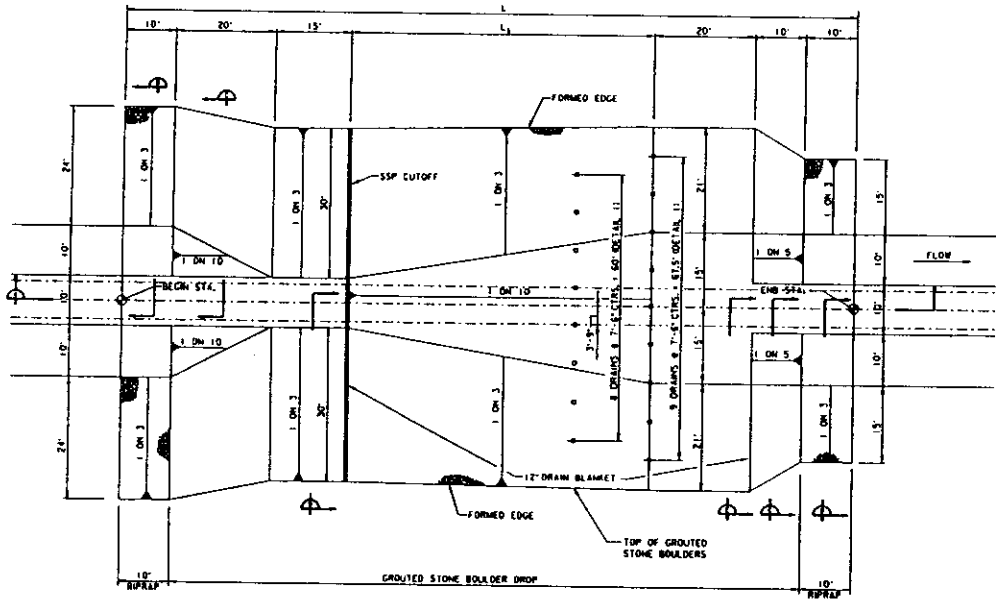
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: M. COUSTOCK
Drawn by: J. NAST
Checked by: G. MILLER
Reviewed by: M. KOCH
Submitted by: BURNS & McDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
TYPICAL SECTIONS II

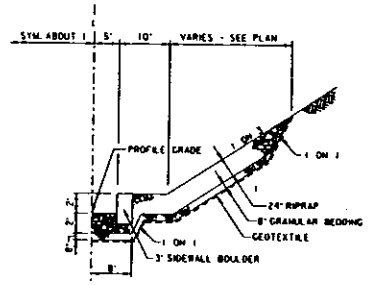
Plot Scale: Appr. 10:1
Design File: BFE_LADDREV3
Date: January 1998
Spec No.: DACW 66
Contract No.: DACW 45
Drawing Code: SPV1-220E 9
Sheet reference number: C-6

Contract Area Drawing Number



TYPICAL PLAN

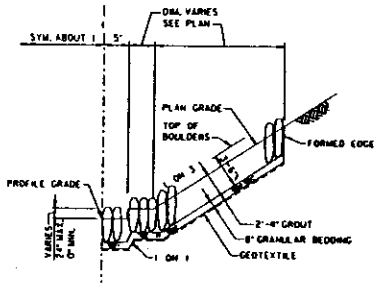
SCALE: 1 INCH = 10 FEET



SECTION

HORIZ. SCALE: 1 INCH = 10 FEET

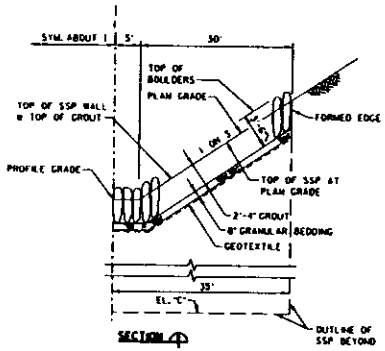
VERT. SCALE: 1 INCH = 5 FEET



SECTION

HORIZ. SCALE: 1 INCH = 10 FEET

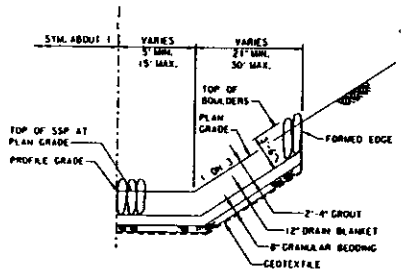
VERT. SCALE: 1 INCH = 5 FEET



SECTION

HORIZ. SCALE: 1 INCH = 10 FEET

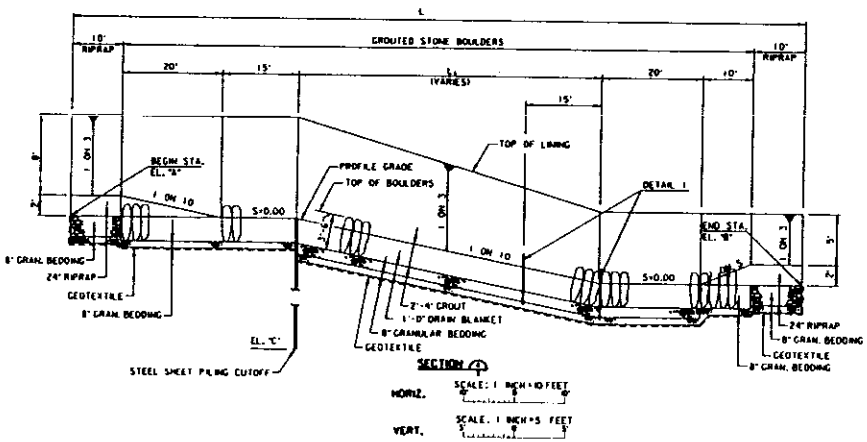
VERT. SCALE: 1 INCH = 5 FEET



SECTION

HORIZ. SCALE: 1 INCH = 10 FEET

VERT. SCALE: 1 INCH = 5 FEET

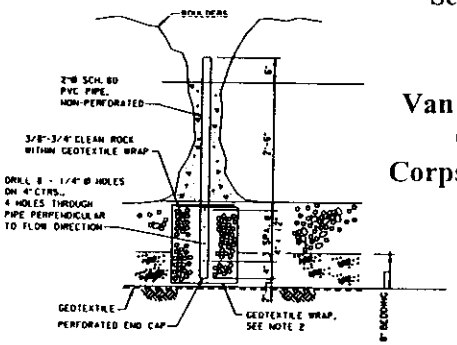


SECTION

HORIZ. SCALE: 1 INCH = 10 FEET

VERT. SCALE: 1 INCH = 5 FEET

DROP NO	LOCATION		LENGTHS (FT.)		ELEVATIONS (FT. NGVD)		
	BEGIN STA.	END STA.	L	L_1	"A"	"B"	"C"
1	33+26.33	34+71.33	145.0	60.0	5353.78	5347.78	5330.00
2	41+58.63	42+78.13	119.5	54.5	5346.41	5342.96	5325.50



DETAIL 1 (11 REQUIRED THUS)

SCALE: 1 INCH = 1' (8")

Segment 1 - Reach Downstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 8

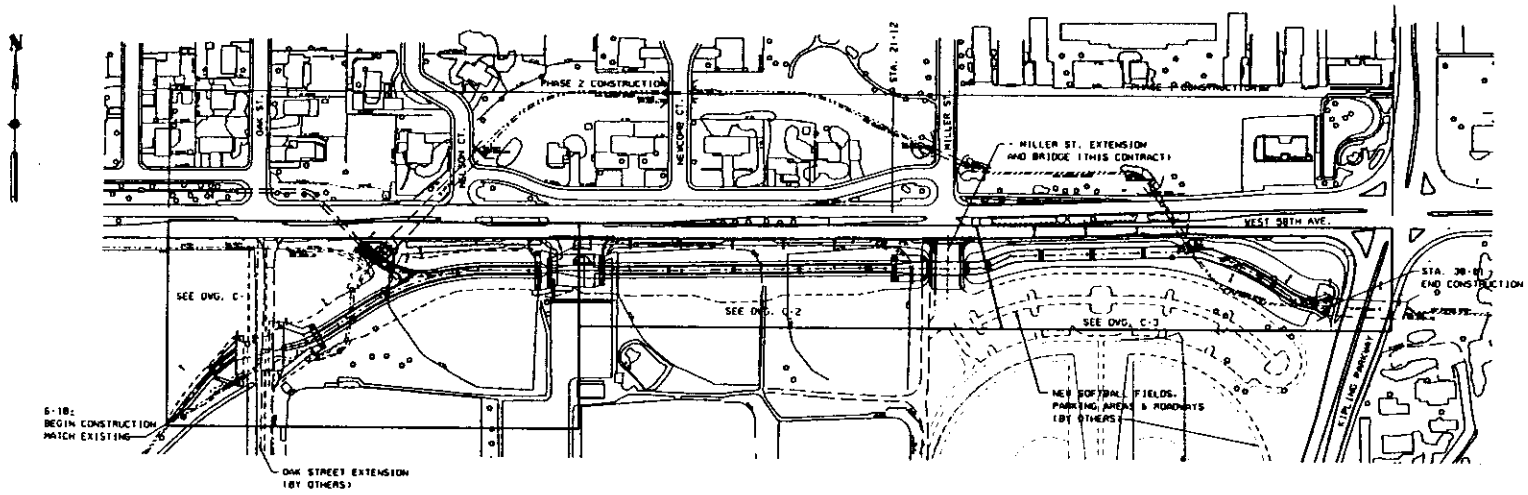
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA

Designed by: M. COMSTOCK
Drawn by: J. MAST
Checked by: C. MILLER
Reviewed by: M. KOCH
Submitted by: BURNS & McDONNELL

VAN BIBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
GROUTED STONE DROP DETAILS

Plot Scale Ratio: 10:1
Design File: HF&E ABBREVS
Date: January 1996
Drawing Code: SPV1-220E 10
C-6



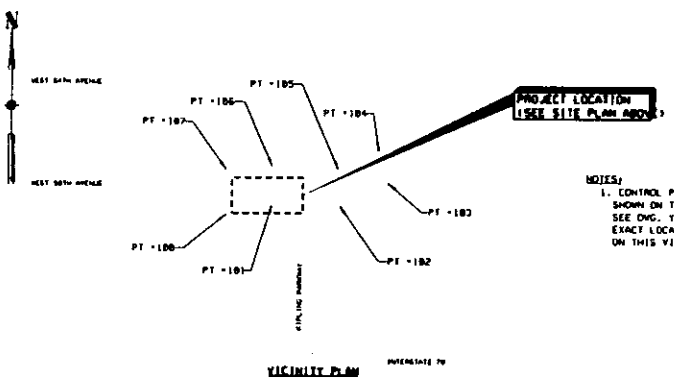
SITE PLAN

SCALE: 1 INCH= 100 FEET

NOTES:
1. SEE DWG. Y-3 FOR PROJECT CHANNEL IMPROVEMENT CENTERLINE ALIGNMENT DATA.
2. SEE DWG. Y-3 FOR COMPLETE LIST OF ALL PROJECT HORIZONTAL AND VERTICAL CONTROL POINTS AND DATA.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION SURVEYING.

Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 9

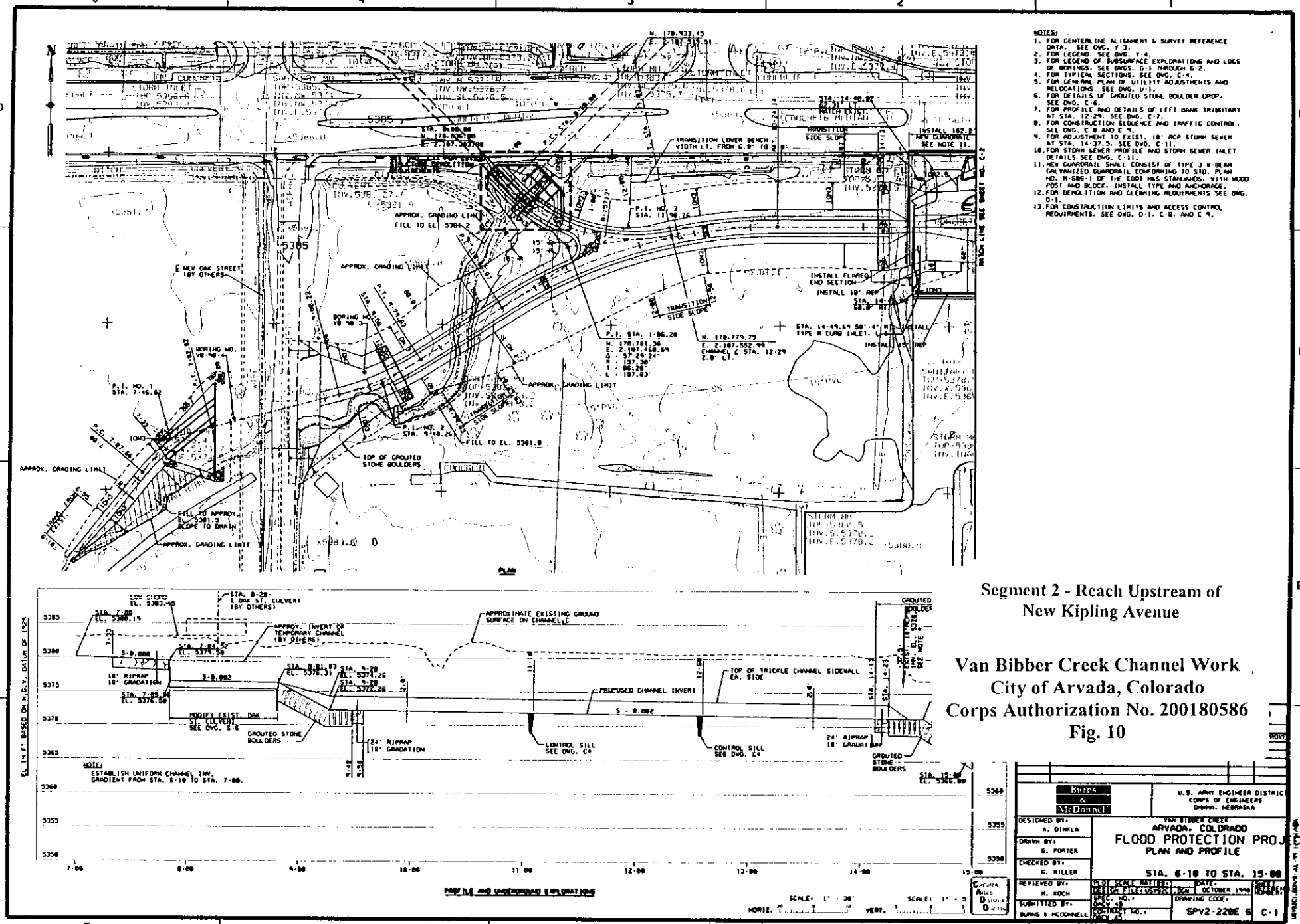


VICINITY PLAN

SCALE: 1 INCH= 2000 FEET

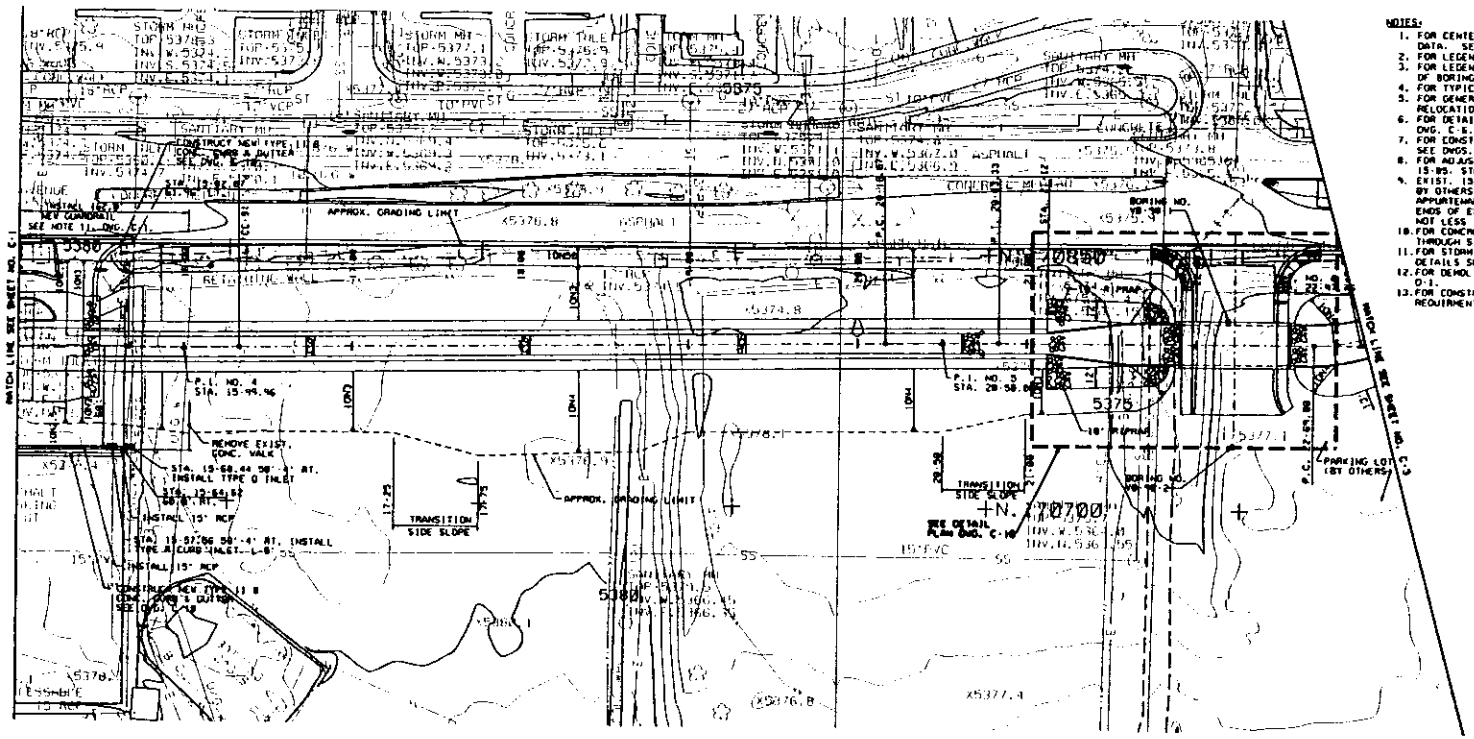
NOTES:
1. CONTROL POINTS PT +100 THROUGH PT +107 SHOWN ON THIS MAP FOR GENERAL INFORMATION ONLY. SEE DWG. Y-3 FOR COMPLETE DESCRIPTIONS AND EXACT LOCATIONS OF ALL CONTROL POINTS SHOWN ON THIS VICINITY MAP.

Burns & McDonnell	U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA
DESIGNED BY: A. DINELA	VAN BIBBER CREEK ARVADA, COLORADO FLOOD PROTECTION PROJECT
DRAWN BY: G. PORTER	SITE PLAN
CHECKED BY: G. MILLER	
REVIEWED BY: H. KOCH	PLOT SCALE (MATCH): DESIGN FILE: USA9272.DGN DATE: OCTOBER 1998
SUBMITTED BY: BURNS & MCDONNELL	SPEC. NO.: DACW 45 CONTRACT NO.: DACW 45 DRAWING CODE: SPV2-220E 2 SHEET NO.: Y-2



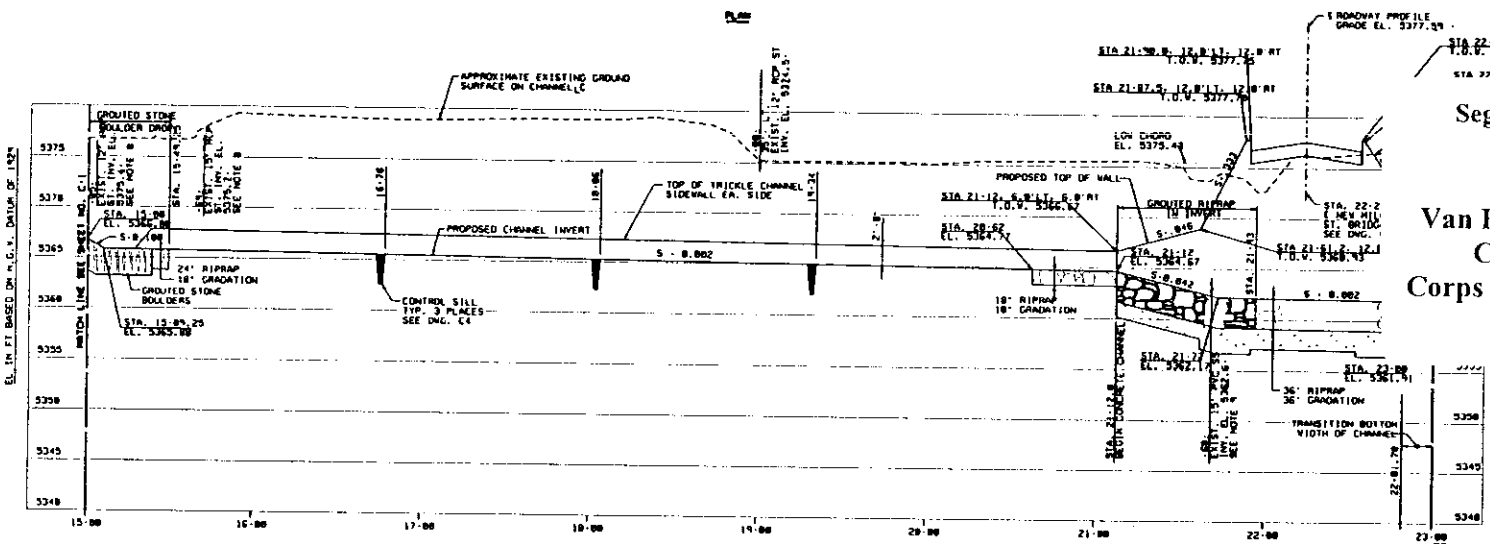
Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 10



NOTES:

1. FOR CENTERLINE ALIGNMENT & SURVEY REFERENCE DATA. SEE DWG. Y-3.
2. FOR LEGEND. SEE DWG. Y-4.
3. FOR LEGEND OF SUBSURFACE EXPLORATIONS AND LOGS OF BORINGS. SEE DWGS. G-1 THROUGH G-2.
4. FOR TYPICAL SECTIONS. SEE DWGS. C-6 AND C-5.
5. FOR GENERAL PLAN OF UTILITY ADJUSTMENTS AND RELOCATIONS. SEE DWG. U-1.
6. FOR DETAILS OF GROUTED STONE BOULDER DROP. SEE DWG. C-6.
7. FOR CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL. SEE DWGS. C-8 AND C-9.
8. FOR ADJUSTMENTS TO EXIST. STORM SEWERS AT STA. 15-89. STA. 15-69.5. AND STA. 19-80. SEE DWG. C-11.
9. EXIST. 15" PVC SS AT STA. 21-60 TO BE RELOCATED BY OTHERS. REMOVE EXIST. SANITARY SEWER AND APPURTENANCES WITHIN LIMITS OF EXCAVATION. PLUG ENDS OF EXIST. SEWERS ABANDONED IN PLACE WITH NOT LESS THAN 2'-0" OF CONCRETE FILL.
10. FOR CONCRETE CHANNEL DETAILS. SEE DWGS. S-1 THROUGH S-4.
11. FOR STORM SEWER PROFILE AND STORM SEWER INLET DETAILS SEE DWG. C-11.
12. FOR DEMOLITION AND CLEARING REQUIREMENTS SEE DWG. D-1.
13. FOR CONSTRUCTION LIMITS AND ACCESS CONTROL REQUIREMENTS. SEE DWG. D-3.



Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 11

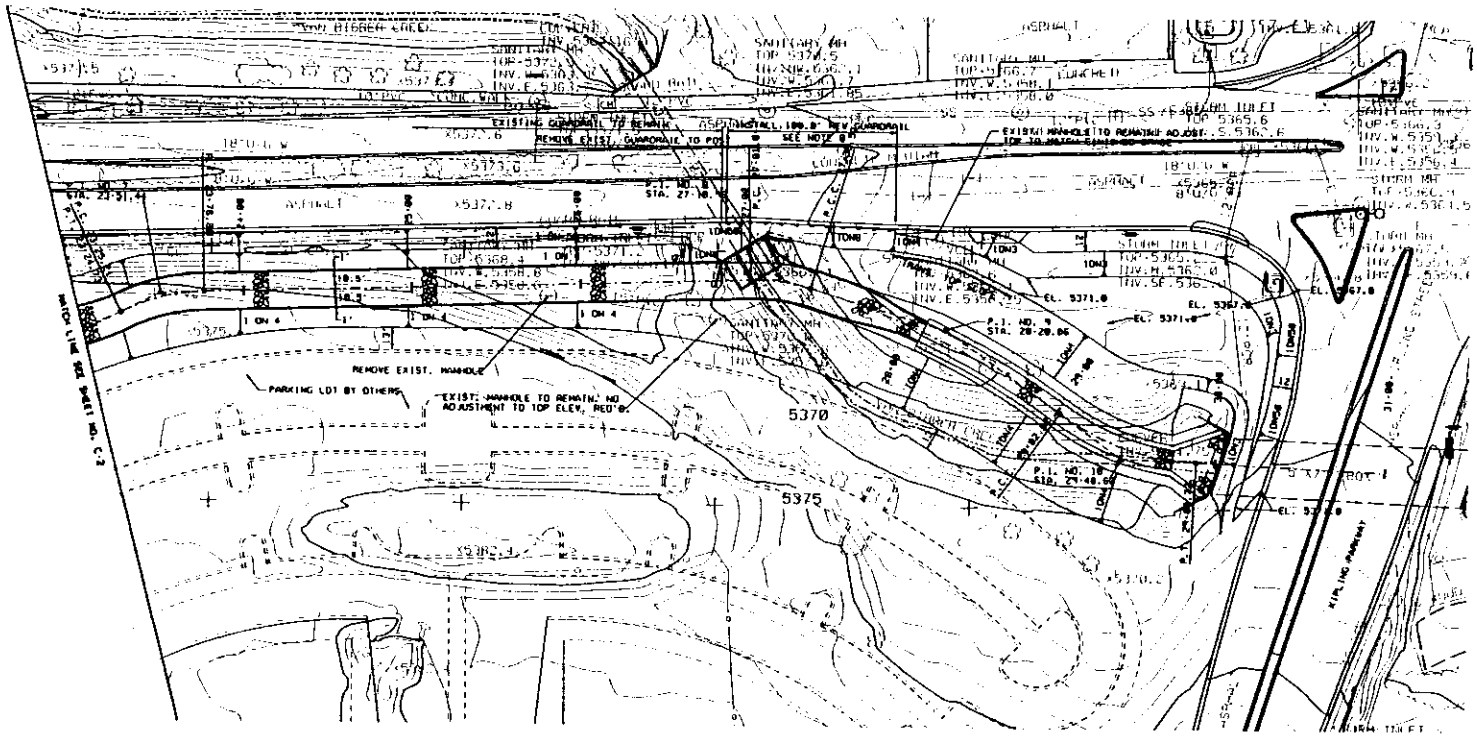
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA

DESIGNED BY: A. DIAKLA
DRAWN BY: G. PORTER
CHECKED BY: G. MILLER
REVIEWED BY: N. KOCH
SUBMITTED BY: BURNS & MCDONNELL

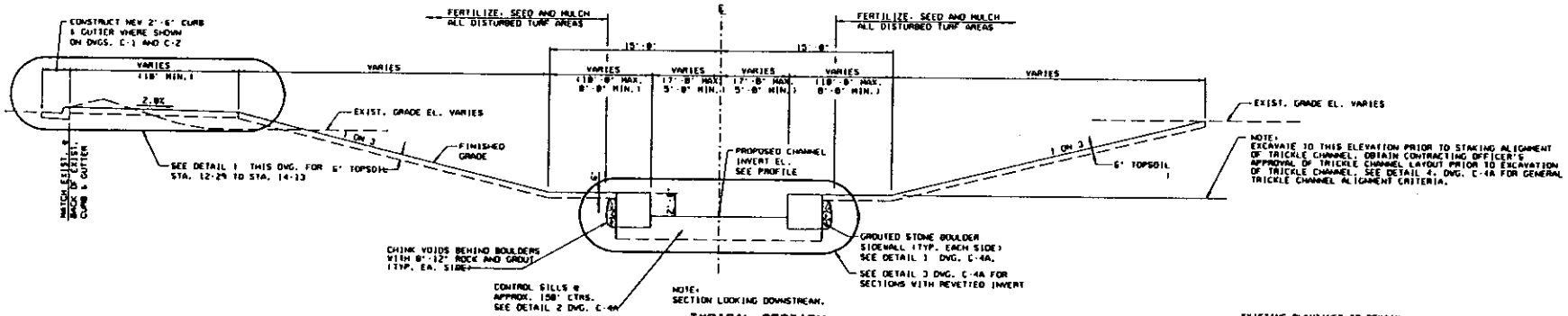
VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
PLAN AND PROFILE
STA. 15-00 TO STA. 23-00

PLOT SCALE: NATIVE | DATE: OCTOBER 1996
DESIGN FILE: SPV2-2.DGN
SPEC. NO.: DACW 45
CONTRACT NO.: DACW 45
DRAWING CODE: SPV2-220E 7
SHEET NO.: C-2

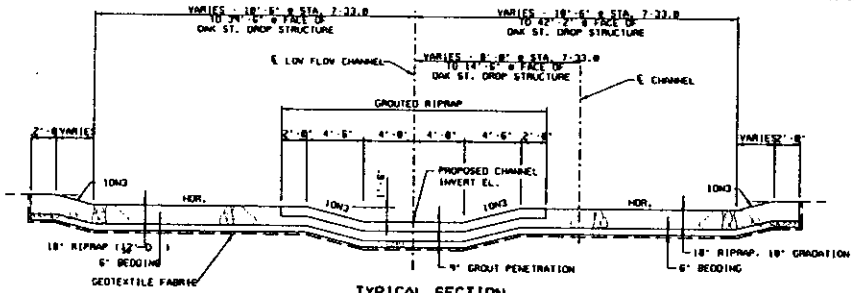


Segment 2 - Reach Upstream of New Kipling Avenue

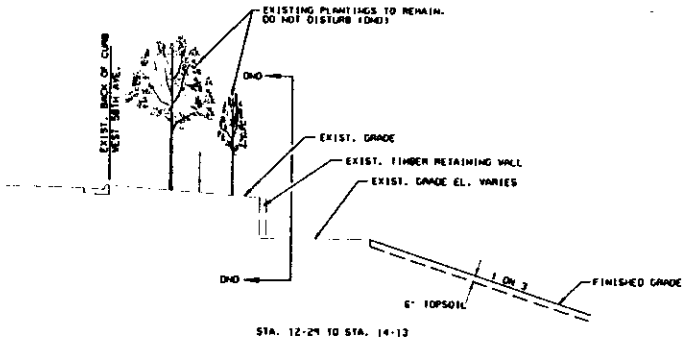
Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 12



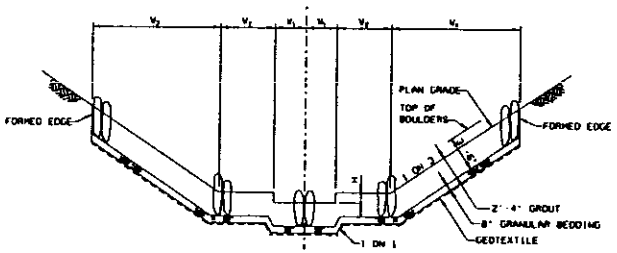
TYPICAL SECTION
STA. 9+58.0 TO STA. 14+13.0
STA. 15+49.25 TO STA. 21+12.0
NOT TO SCALE



TYPICAL SECTION
STA. 7+33.0 TO STA. 7+84.52
NOT TO SCALE



DETAIL 4
NOT TO SCALE



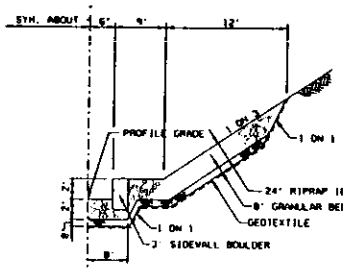
SCHEDULE OF DIMENSIONS (FT)					
℄ STATION	V1	V2	V3	V4	H
8+81.83	0.00	13.00*	14.00*	13.00*	0.00
9+00.0	6.00	9.00	14.45	12.50	0.00
9+25.0	6.00	9.00	TRANSITION	12.00	0.00
9+41.5	0.00	9.00	12.00	12.00	0.00
9+48.0	0.00	9.00	12.00	12.00	0.00

* THESE MAXIMUMS ARE LOCATED AT THE FAR EAST END OF THE EASTERLY VITRIFIEDS AND TRANSITION FROM THERE AS SHOWN.

TYPICAL SECTION
STA. 8+81.83 TO STA. 9+48.0

HORIZ. SCALE: 1 INCH 10 FEET

VERT. SCALE: 1 INCH 5 FEET



TYPICAL SECTION
STA. 9+48.0 TO 9+58.0

HORIZ. SCALE: 1 INCH 10 FEET

VERT. SCALE: 1 INCH 5 FEET

Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 13

Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS OMAHA, NEBRASKA

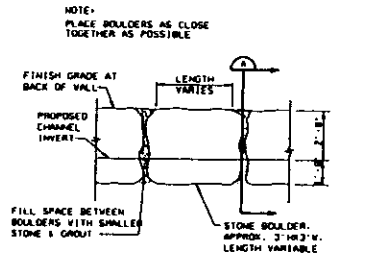
DESIGNED BY: A. DHKLA
DRAWN BY: G. PORTER
CHECKED BY: G. MILLER
REVIEWED BY: M. KOCH
SUBMITTED BY: BURNS & MCDONNELL

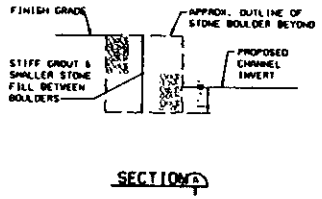
VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT

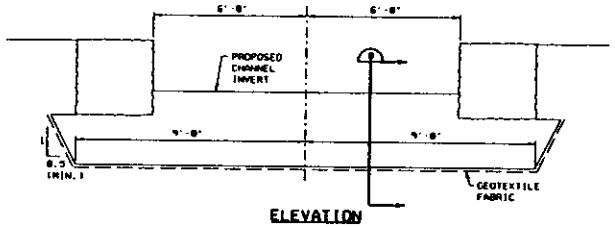
TYPICAL CHANNEL SECTIONS

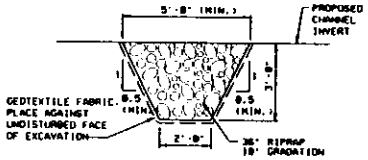
PLOT SCALE: NATIVE
DESIGN FILE: VBCC4.DGN
SPEC. NO.:
DACW 45
CONTRACT NO.:
DACW 45
DATE: OCTOBER 1998
DRAWING CODE: SPV2-220E
SHEET NUMBER: C-4

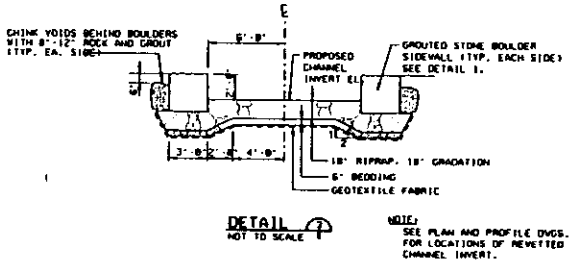
Corps of Engineers Omaha District



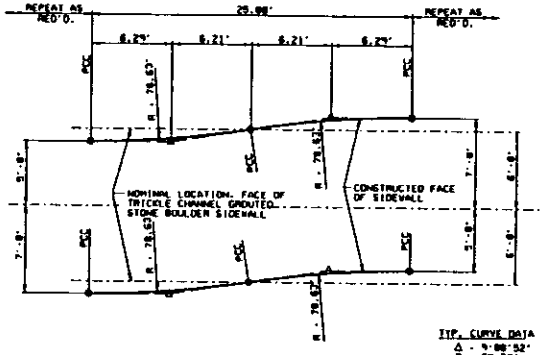


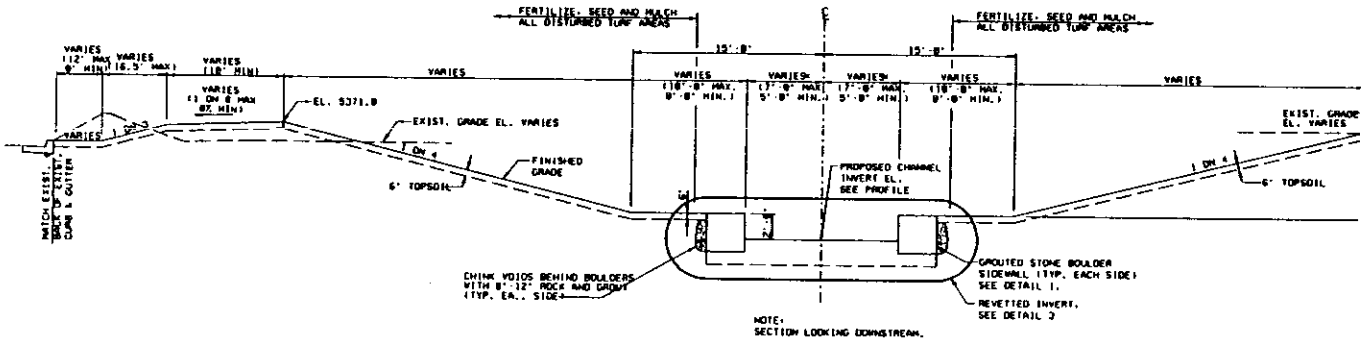






NOTE:
SEE PLAN AND PROFILE DWGS. FOR LOCATIONS OF REVETTED CHANNEL INVERT.





NOTE:
SECTION LOOKING DOWNSTREAM.

TYPICAL SECTION
STA. 28+00.0 TO STA. 30+01.0
NOT TO SCALE

* TRANSITION FROM 6'-0" AT STA. 29+75 TO APPROX. 10.0' AT ENTRANCE TO EXIST. 3-12'X6' RCB; MATCH EXIST. RCB OPENING

Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 14

Burns & McDonnell

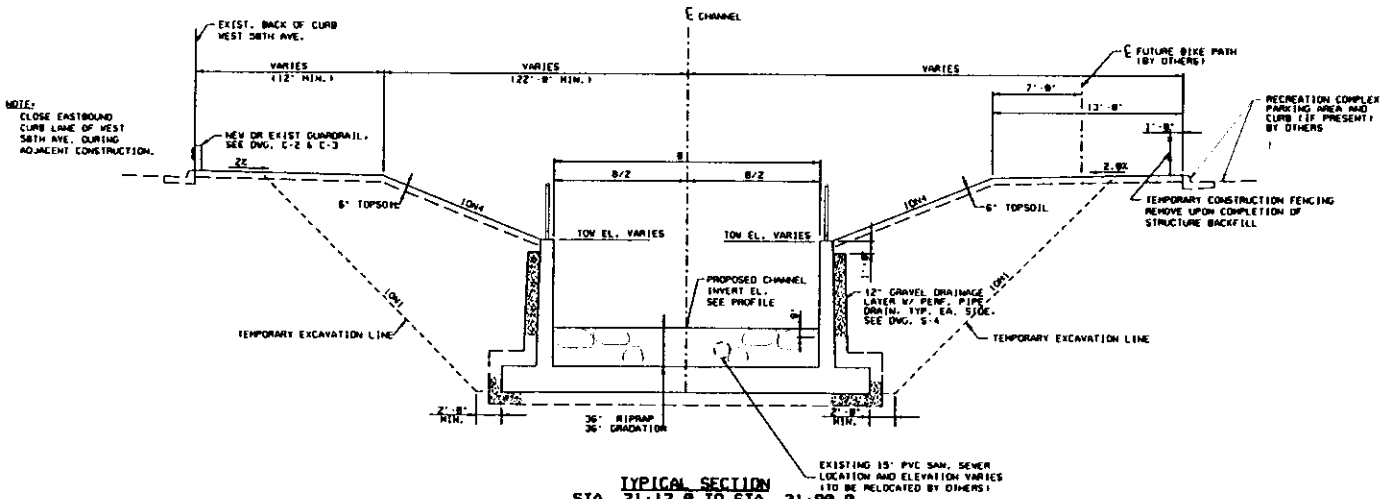
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: A. DINKLA
DRAWN BY: G. PONTER
CHECKED BY: G. MILLER
REVIEWED BY: R. KOCH
SUBMITTED BY: BURNS & MCDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT

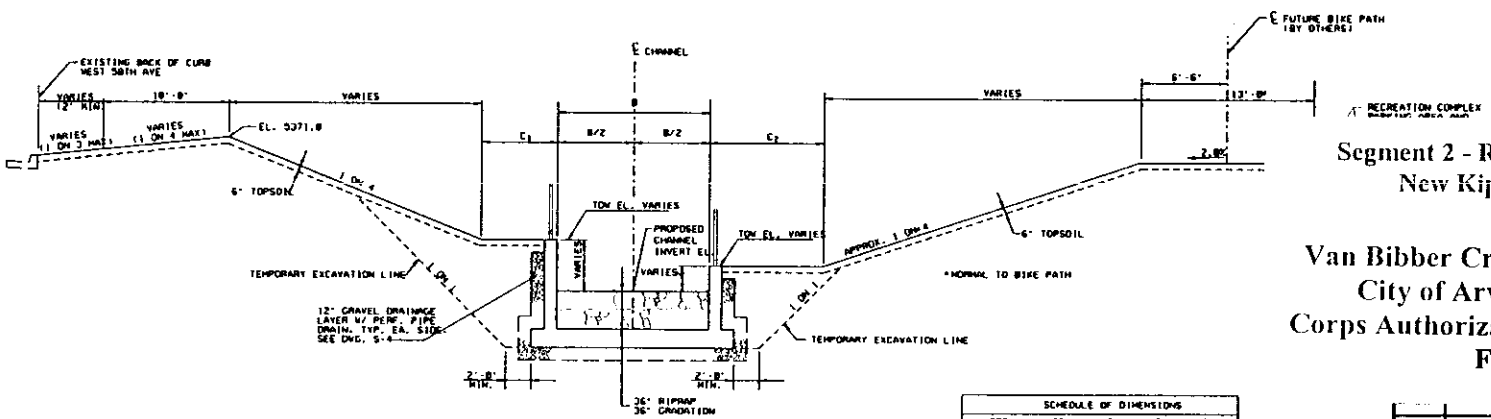
TYPICAL CHANNEL SECTIONS

PLOT SCALE (NATIVE):
DESIGN FILE: USVR2C4.DGN
DATE: OCTOBER 1998
SPEC. NO.: (ACEY 45)
DRAWING CODE: SPV2-220E 10 C-4A
CONTRACT NO.: (ACEY 45)



SCHEDULE OF DIMENSIONS		
FROM STA.	TO STA.	B (FT-IN)
----	21-12.0	12'-0"
21-12.0	21-61.2	VARIES
21-61.2	22-01.7	24'-0"
22-01.7	23-24.73	VARIES
23-24.73	27-36.57	21'-0"

TYPICAL SECTION
STA. 21+12.0 TO STA. 21+90.0
STA. 22+56.0 TO STA. 27+36.57
NOT TO SCALE



SCHEDULE OF DIMENSIONS				
FROM STA.	TO STA.	B (FT-IN)	C1 (FT-IN)	C2 (FT-IN)
27-36.57	27-57	21'-0"	1'-0"	VARIES
27-57	27-93	VARIES	VARIES	VARIES
27-93	28-08	12'-0"	VARIES	6'-0"
28-08	----	12'-0"	4'-0"	6'-0"

TYPICAL SECTION
STA. 27+36.57 TO STA. 28+08
NOT TO SCALE

Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 15

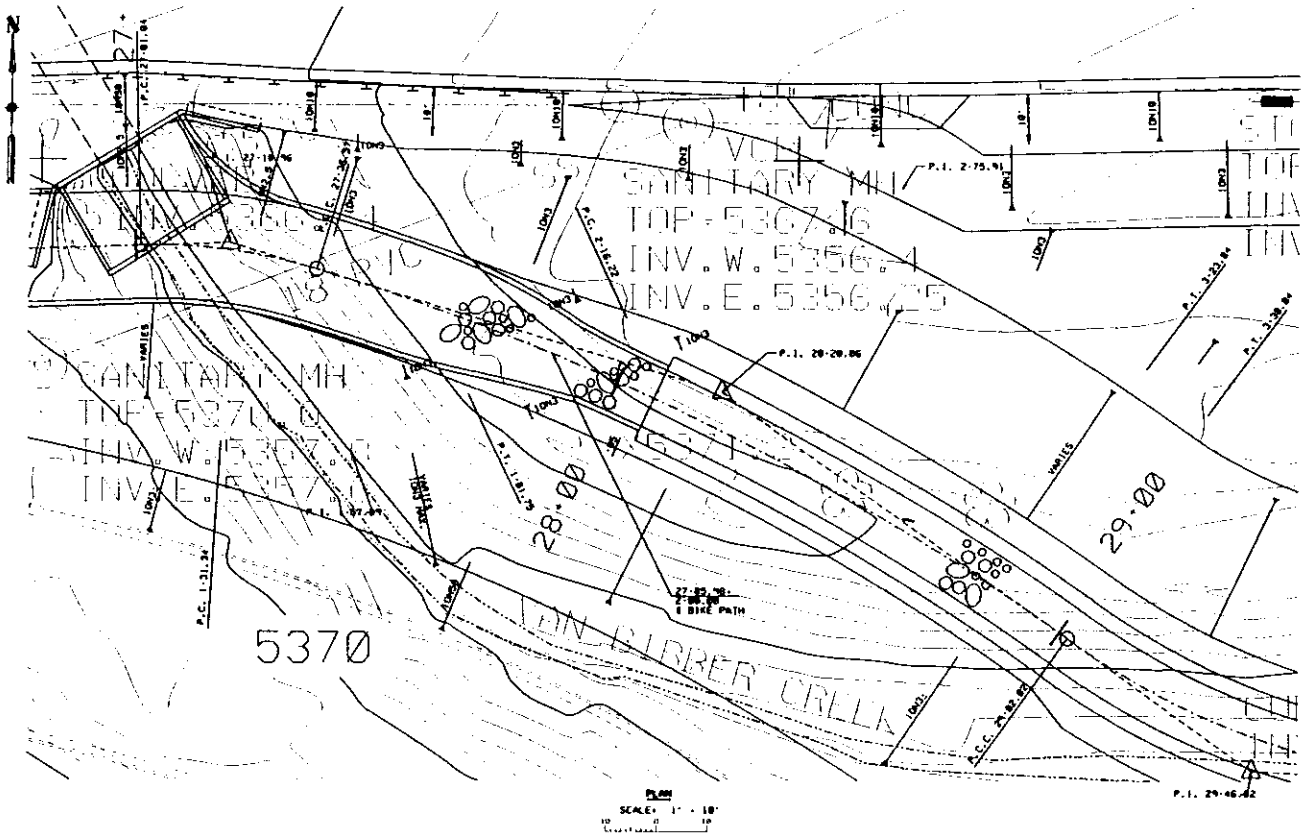
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT, CORPS OF ENGINEERS, OMAHA, NEBRASKA

DESIGNED BY: A. DIAHLA
DRAWN BY: G. PORTER
CHECKED BY: G. MILLER
REVIEWED BY: H. KOCH
SUBMITTED BY: BURNS & MCDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
TYPICAL CHANNEL SECTIONS

PLOT SCALE: NATIVE
DATE: OCTOBER 1998
SPEC. NO.: DACW 45
CONTRACT NO.: DACW 45
DRAWING CODE: SPV2-220E
SHEET: C-5



NOTES:
1. FOR CENTERLINE ALIGNMENT & SURVEY REFERENCE DATA. SEE DWG. Y-3.
2. FOR LEGEND. SEE DWG. Y-4.
3. FOR LEGEND OF SUBSURFACE EXPLORATIONS AND LOGS OF BORINGS. SEE DWGS. G-1 THROUGH G-7.
4. FOR TYPICAL SECTIONS. SEE DWGS. C-4 AND C-5.
5. FOR GENERAL PLAN OF UTILITY ADJUSTMENTS AND RELOCATIONS. SEE DWG. U-1.

Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 16

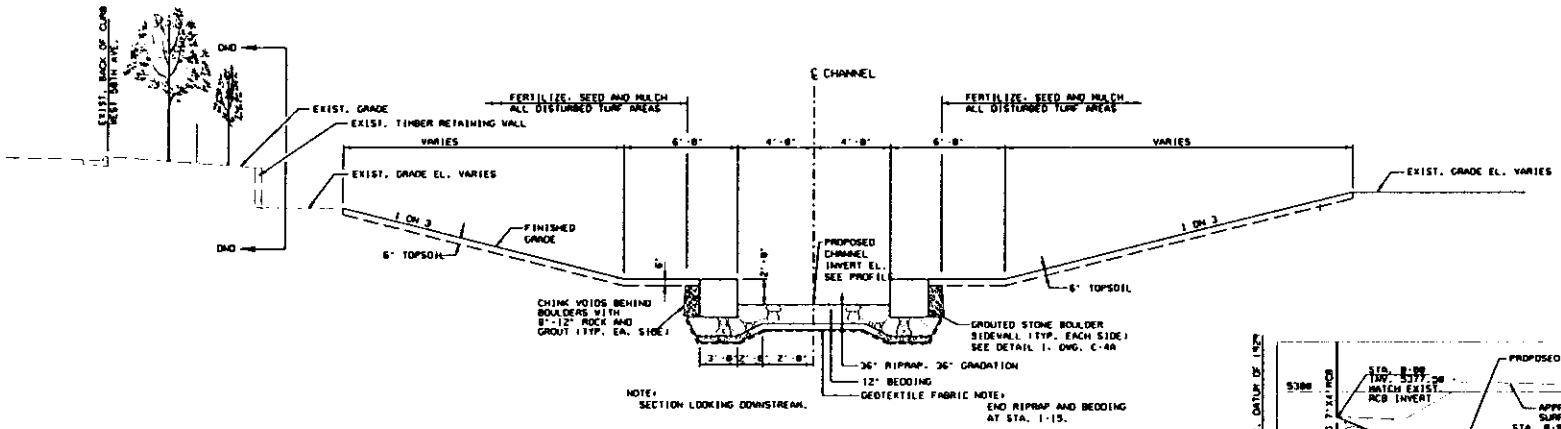
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

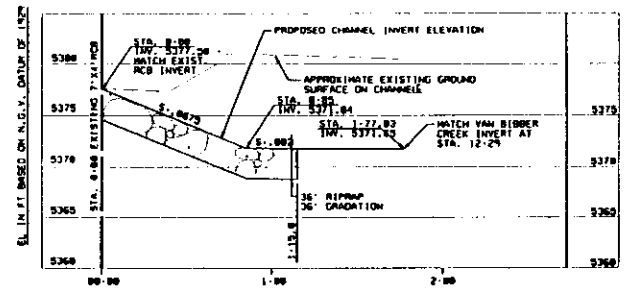
DESIGNED BY: A. OTAKLA
DRAWN BY: G. PORTER
CHECKED BY: G. MILLER
REVIEWED BY: M. KOCH
SUBMITTED BY: BURNS & MCDONNELL

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
BIKE PATH CROSSING
DETAIL PLAN

PLOT SCALE RATIO: 1:1
DATE: OCTOBER 1998
DESIGN FILE: USPVA22.DGN
SPEC. NO.:
DWG. NO.:
CONTRACT NO.:
DRAWING CODE: SPV2-220E 12
SHEET NO.: C-6

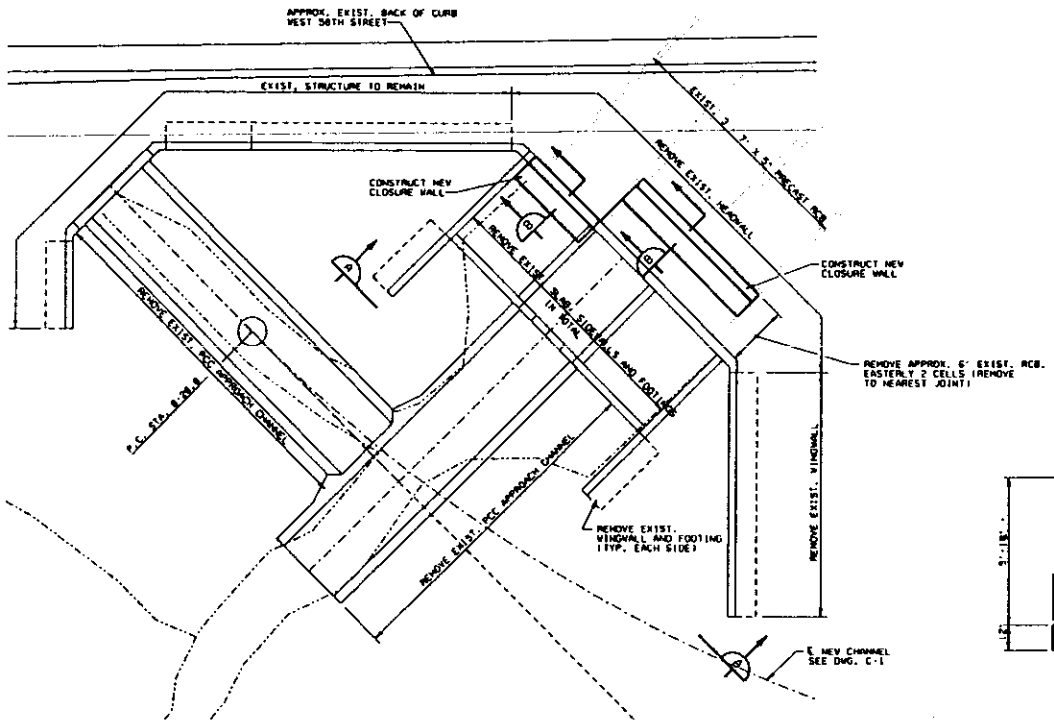


TYPICAL SECTION
LEFT BANK TRIBUTARY
AT STA. 12+29
NOT TO SCALE

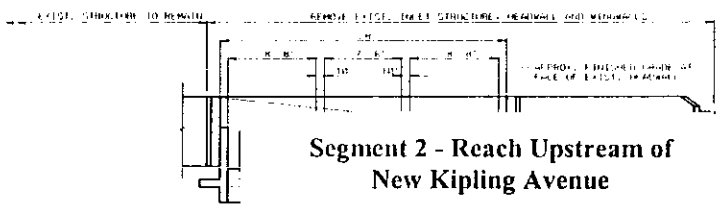


PROFILE
LEFT BANK TRIBUTARY
AT STA. 12+29

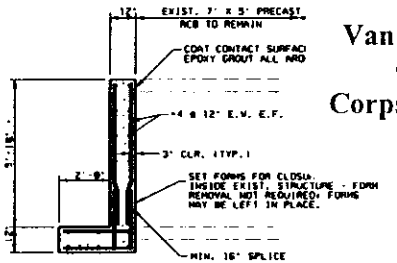
SCALE: 1" = 20' HORIZ. SCALE: 1" = 5' VERT.



EXISTING STRUCTURE DEMOLITION PLAN
SCALE: 1" = 5'



Segment 2 - Reach Upstream of New Kipling Avenue



SECTION B
SCALE: 1/2 INCH = 1 FOOT

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 17

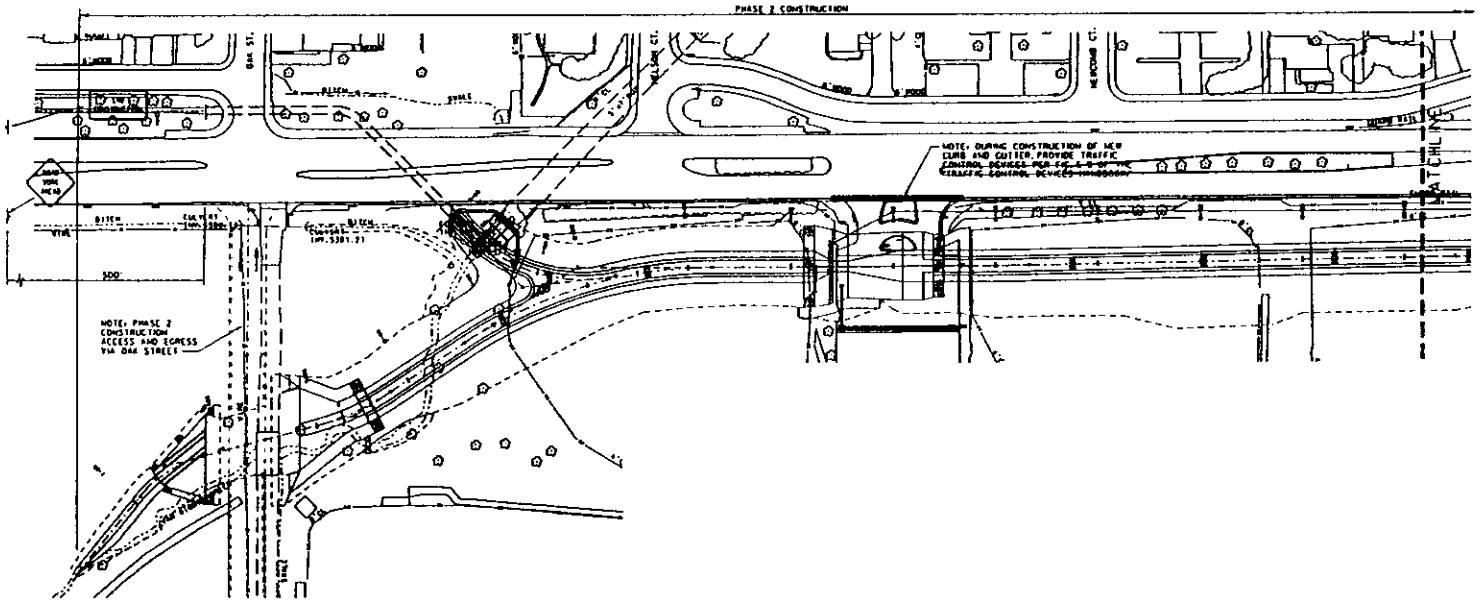
Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

DESIGNED BY: A. DIHKLA
DRAWN BY: G. PORTER
CHECKED BY: G. MILLER
REVIEWED BY: N. KOCH
SUBMITTED BY: BURNS & MCDONNELL

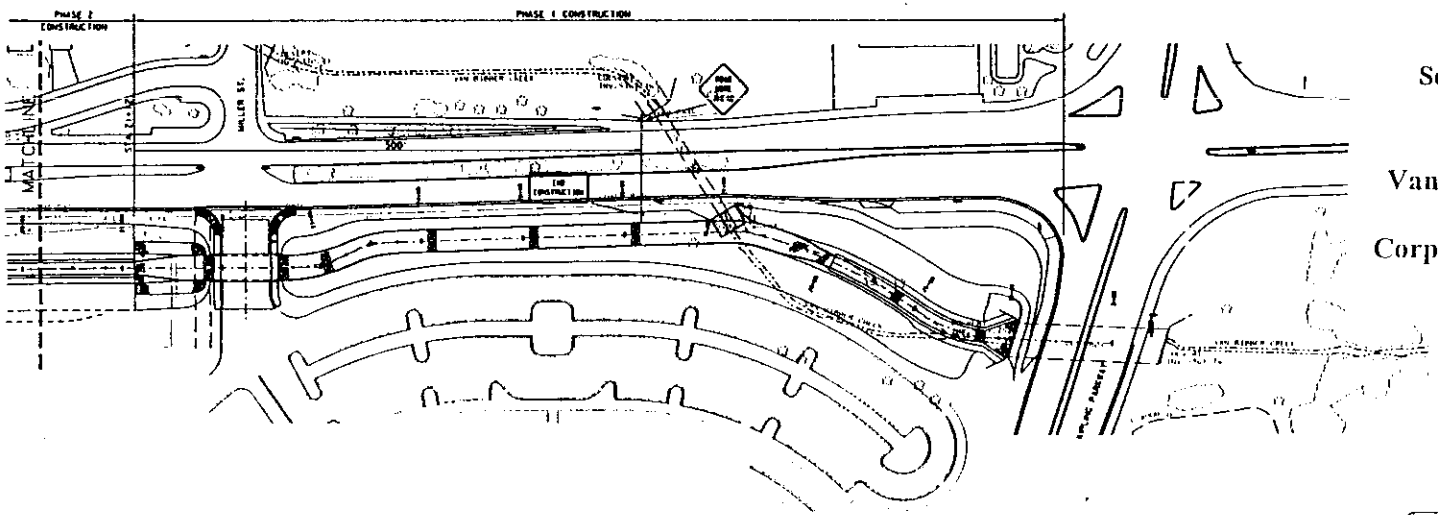
VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
PLAN, PROFILE AND
TRIBUTARY DETAILS, STA. 12+29

PLOT SCALE: NATIVE
DESIGN FILE: V4VBC7.DGN
SPEC. NO.:
DACW 45
CONTRACT NO.:
DATE: OCTOBER 1998
DRAWING CODE:
SPV2-220E 13 C-7



NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO SECTION 630 "CONSTRUCTION ZONE TRAFFIC CONTROL" OF THE CDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. FOR ADDITIONAL INFORMATION ON CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL PLAN SEE DWG. 0-4.



Segment 2 - Reach Upstream of New Kipling Avenue

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 18

Burns & McDonnell

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

VAN BIBBER CREEK
ARVADA, COLORADO
FLOOD PROTECTION PROJECT
CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL PLAN
PHASE 2

Designed by: A. DINELA
Drawn by: D. HOWARD
Checked by: G. MILLER
Reviewed by:
Submitted by: BURNS & McDONNELL

Plot Scale Ratio: 1:1
Date: October 1996
Drawing File: 1696TC1.DGN
Sheet No.: DACW 46
Drawing Code: SPV2-220E 16
Contract No.: DACW 45
C-9

STATE OF COLORADO

Bill Owens, Governor
Jane E. Norton, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
TDD Line (303) 691-7700
Located in Glendale, Colorado

Laboratory and Radiation Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

http://www.cdphe.state.co.us

Colorado Department
of Public Health
and Environment

December 10, 2001

Gail Campos
CENWO-PM-AE
US Army Corps of Engineers
215 North 17th Street
Omaha, NE 68104

Re: Section 401 Water Quality Certification
Permit No. COE 200180586
Colo. Cert. No. 2946

Dear Sir or Madam:

The Water Quality Control Division has reviewed the federal license or permit application, public notice, or other information submitted related to certification for the activity described below. Provided the plans of operation included in the submitted information are followed and the attached General Conditions (where applicable) are complied with, the Division is reasonably assured that Sections 301, 302, 303, 306 and 307 of the Clean Water Act and applicable sections of the Colorado Water Quality Control Act will not be violated by this activity.

Description: Dredge and fill in connection with channel improvements and to improve flood control.

Location: Section 9, Township 3 South, Range 69 West , Jefferson County, Colorado.

Watercourse: Van Bibber Creek, South Platte River Basin, Segment COSPCL18a/b of Clear Creek Sub-basin.

This certification does not constitute a relinquishment of the Water Quality Control Division's authority as delineated in the "Colorado Water Quality Control Act," or any subsequent alterations thereto, nor does it fulfill or waive any other local, state or federal regulations.

Sincerely,

Aimee Majewski
Water Quality Assessor
WATER QUALITY CONTROL DIVISION

Attachment

cc: U. S. Army Corps of Engineers, Denver Regulatory Office
U. S. Army Corps of Engineers, Omaha District
Comments, Eric Odell, CDOW
Comments, Glenn Rodriguez, US EPA
District Engineer, Cary Pilon, WQCD
File

DEC 2001

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 19

Certification Requirements:

(A) The following requirements shall apply to all certifications:

(1) Authorized representatives from the Division shall be permitted to enter upon the site where the construction activity or operation of the project is taking place for purposes of inspection of compliance with BMPs and certification conditions.

(2) In the event of any changes in control or ownership of facilities where the construction activity or operation of the project is taking place, the successor shall be notified in writing by his predecessor of the existence of the BMPs and certification conditions. A copy of such notification shall be provided to the Division.

(3) If the permittee discovers that certification conditions are not being implemented as designed, or if there is an exceedance of water quality standards despite compliance with the certification conditions and there is reason to believe that the exceedance is caused, in whole or in part, by the project, the permittee shall verbally notify the Division of such failure or exceedance within two (2) working days of becoming aware of the same. Within ten (10) working days of such notification, the permittee shall provide to the Division, in writing, the following:

(a) In the case of the failure to comply with the certification conditions, a description of (i) the nature of such failure, (ii) any reasons for such failure, (iii) the period of non-compliance, and (iv) the measures to be taken to correct such failure to comply; and

(b) In the case of the exceedance of a water quality standard, (i) an explanation, to the extent known after reasonable investigation, of the relationship between the project and the exceedance, (ii) the identity of any other known contributions to the exceedance, and (iii) a proposal to modify the certification conditions so as to remedy the contribution of the project to the exceedance.

(4) Any anticipated change in discharge location and/or quantities associated with the project which may result in water quality impacts not considered in the original certification must be reported to the Division by submission of a written notice by the permittee prior to the change. If the change is determined to be significant, the permittee will be notified within ten days, and the change will be acknowledged and approved or disapproved.

(5) Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions herein is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any

facilities necessary for compliance with limitations and prohibitions herein. The Division shall be notified immediately in writing of each such diversion or bypass.

(6) At least fifteen days prior to commencement of a project in a watercourse, which the Division has certified, or conditionally certified, the permittee shall notify the following:

(a) Applicable local health departments;

(b) Owners or operators of municipal and domestic water treatment intakes which are located within twenty miles downstream from the site of the project; and

(c) Owners or operators of other intakes or diversions which are located within five miles downstream from the site of the project.

The permittee shall maintain a list of the persons and entities notified, including the date and form of notification.

(7) Immediately upon discovery of any spill or other discharge to waters of the state not authorized by the applicable license or permit, the permittee shall notify the following;

(a) Applicable local health departments;

(b) Owners or operators of municipal and domestic water treatment intakes which are located within twenty miles downstream from the site of the project; and

(c) Owners or operators of other intakes or diversions which are located within five miles downstream from the site of the project.

The permittee shall maintain a list of the persons and entities notified, including the date and form of notification.

(8) Construction operations within watercourses and water bodies shall be restricted to only those project areas specified in the federal license or permit.

(9) No construction equipment shall be operated below the existing water surface unless specifically authorized by the 401 certification issued by the Division.

(10) Work should be carried out diligently and completed as soon as practicable. To the maximum extent practicable, discharges of dredged or fill material shall be restricted to those periods when impacts to designated uses are minimal.

(11) The project shall incorporate provisions for operation, maintenance, and replacement of BMPs to assure compliance with the conditions identified in this section, and any other conditions placed in the permit or certification. All such provisions shall be identified and compiled in an operation and maintenance plan which will be retained by the project owner and available for inspection within a reasonable timeframe upon request by any authorized representative of the Division.

(12) The use of chemicals during construction and operation shall be in accordance with the manufacturers' specifications. There shall be no excess application and introduction of chemicals into state waters.

(13) All solids, sludges, dredged or stockpiled materials and all fuels, lubricants, or other toxic materials shall be controlled in a manner so as to prevent such materials from entering state waters.

(14) All seed, mulching material and straw used in the project shall be state-certified weed-free.

(15) Discharges of dredged or fill material in excess of that necessary to complete the project are not permitted.

(16) Discharges to state waters not identified in the license or permit and not certified in accordance therewith are not allowed, subject to the terms of any 401 certification.

(17) Except as otherwise provided pursuant to subsection 82.7(C), no discharge shall be allowed which causes non-attainment of a narrative water quality standard identified in the Basic Standards and Methodologies for Surface Waters, Regulation #31 (5 CCR 1002-31), including, but not limited to discharges of substances in amounts, concentrations or combinations which:

(a) Can settle to form bottom deposits detrimental to beneficial uses; or

(b) Form floating debris, scum, or other surface materials sufficient to harm existing beneficial uses; or

(c) Produce color, odor, or other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species, or to the water; or

(d) Are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life; or

(e) Produce a predominance of undesirable aquatic life; or

(f) Cause a film on the surface or produce a deposit on shorelines.

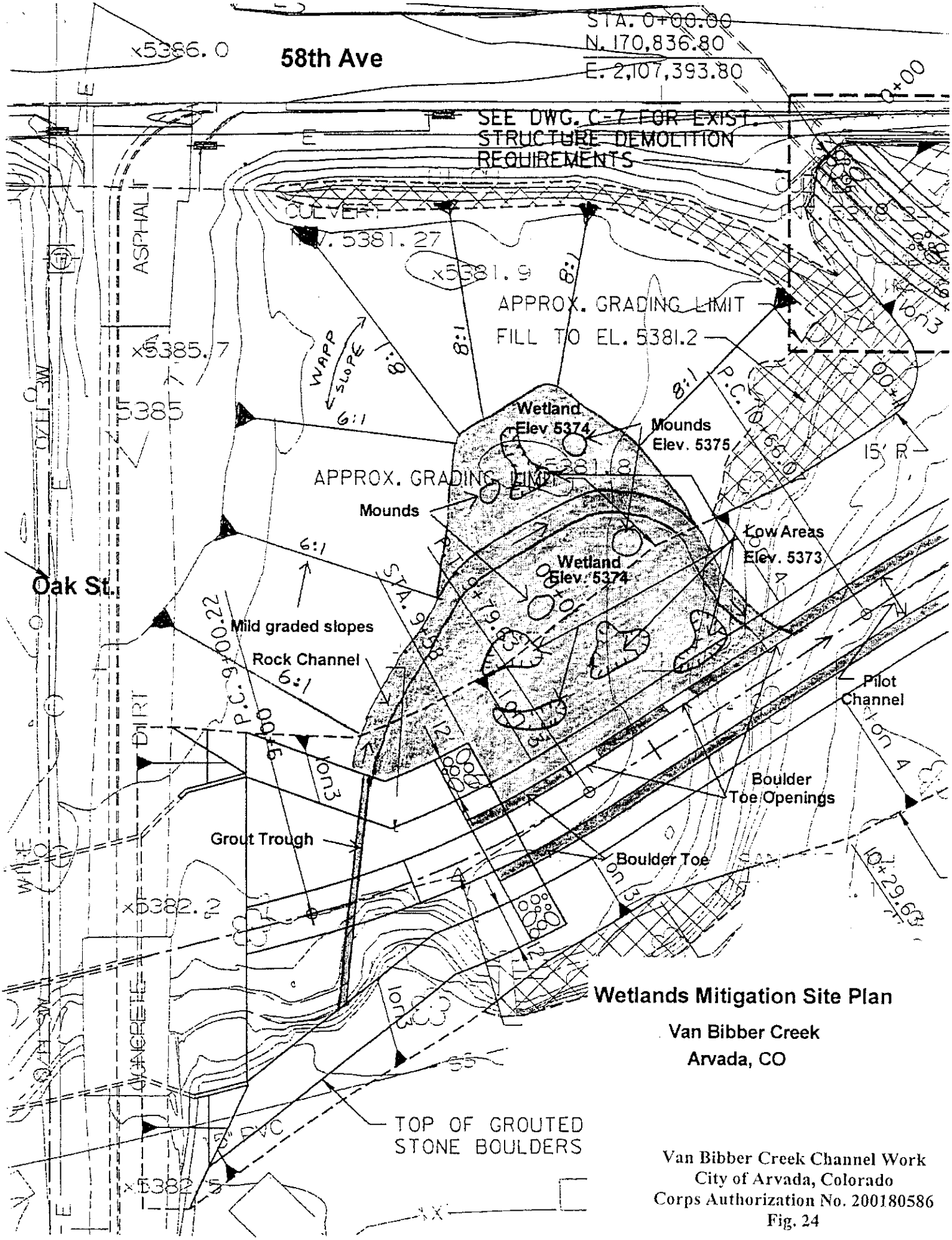
(B) Best Management Practices:

(1) Best management practices are required for all projects for which Division certification is issued except for section 402 permits. Project applicants must select BMPs to be employed in their project. A listing and description of best management practices is located in Appendix I of Regulation No. 82: 401 Certification Regulation 5 CCR 1002-82.

(2) All requests for certifications which require BMPs shall include a map of project location, a site plan, and a listing of the selected BMPs chosen for the project. At a minimum, each project must provide for the following:

(a) Permanent erosion and sediment control measures that shall be installed at the earliest practicable time consistent with good construction practices and that shall be maintained and replaced as necessary throughout the life of the project.

(b) Temporary erosion and sediment control measures that shall be coordinated with permanent measures to assure economical, effective, and continuous control throughout the construction phase and during the operation of the project.

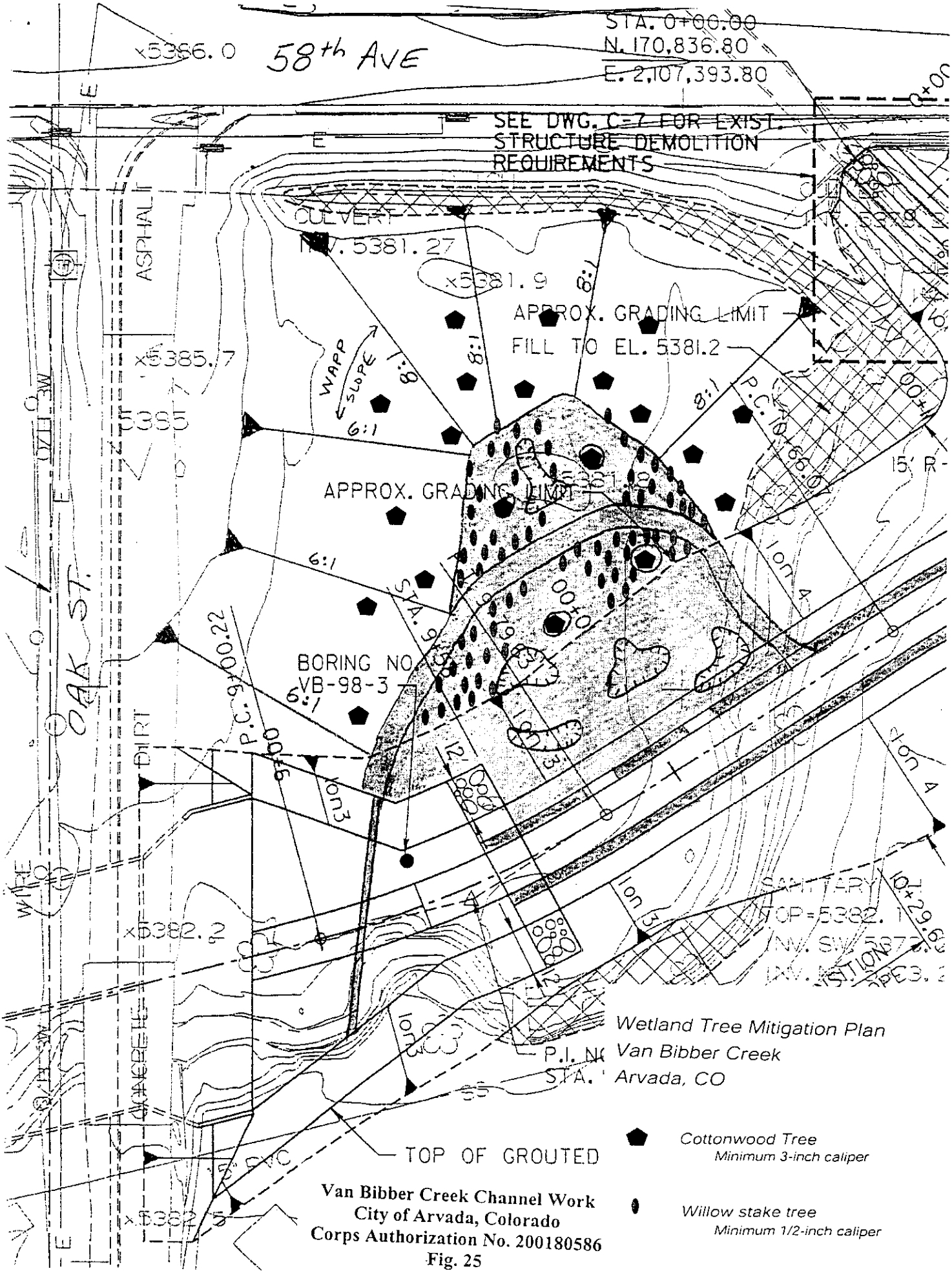


Wetlands Mitigation Site Plan

Van Bibber Creek

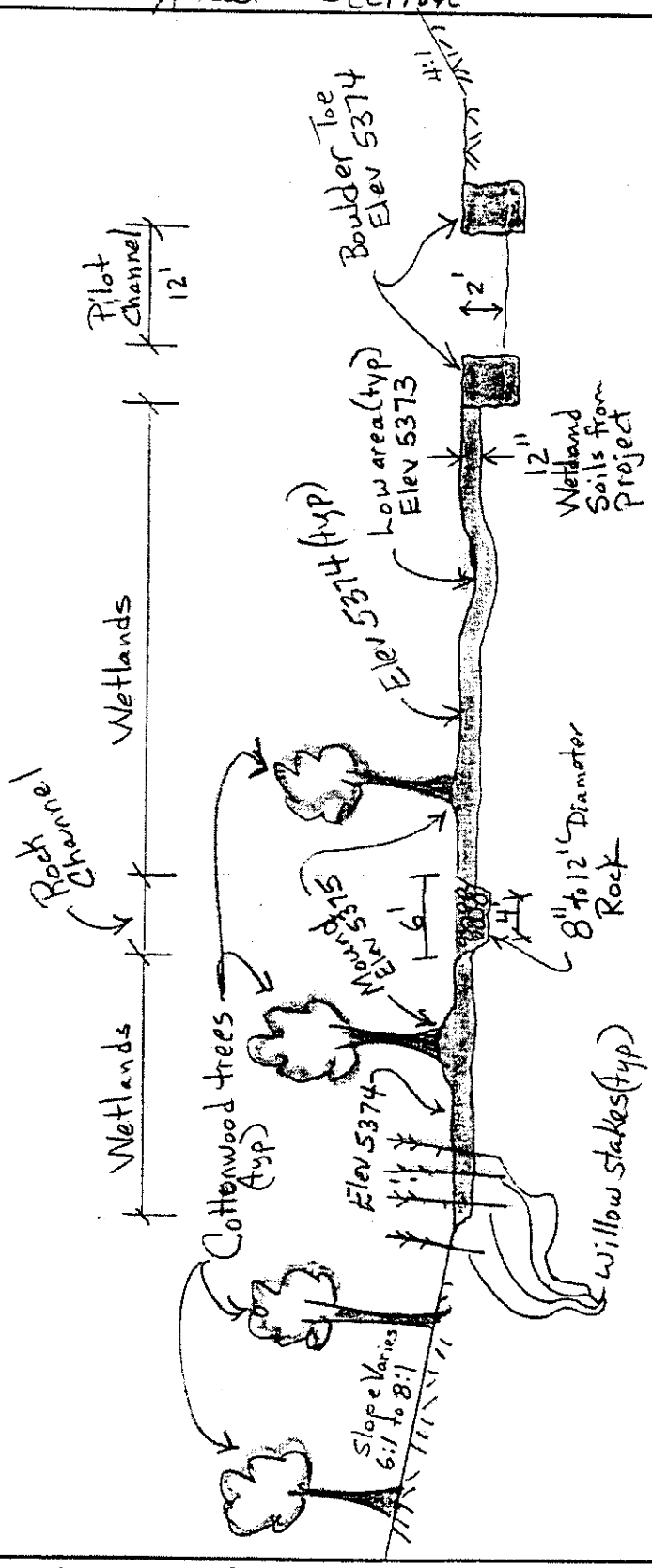
Arvada, CO

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 24



Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 25

OMAHA DISTRICT	COMPUTATION SHEET	CORPS OF ENGINEERS
PROJECT Van Bibber Creek	SHEET NO. 1 OF 1	
ITEM Wetland Mitigation Plan Typical Section	BY RM	DATE 12/3/01
	CHKD. BY	DATE



WETLAND TYPICAL SECTION

Not to scale

Section @ Station 10+00

MRO Form 1550, 1 DEC 83

Page _____

Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization No. 200180586
Fig. 26

CENWO-OD-R-CO **March 25, 2003**

MEMORANDUM FOR CENWO-PM-AP (Mattson)

SUBJECT: Van Bibber Creek Section 205
Amendment No. 1, Section 404 Authorization No. 200180586

1. This memo constitutes Amendment No.1 to Department of the Army Section 404 Authorization No. 200180586 for changes to the mitigation plan just downstream of Oak Street on Van Bibber Creek.

2. The original authorization was issued for excavation and placement of fill material into Van Bibber Creek and adjacent wetlands in conjunction with Section 205 channel work on the creek. The work is located along Van Bibber Creek in the City of Arvada, south of 58th Avenue between Oak Street and Garrison Street. The project is located in Section 9, Township 3 South, Range 69 West, Jefferson County, Colorado.

3. Efforts were made to finalize the design plans so that the Omaha District could advertise for construction. During the in-house Engineering Division quality control review of the final design, it was recommended by Engineering Division staff to modify the method of diverting the water to the wetland site by constructing an inlet and pipe to replace the grout trough. The City of Arvada subsequently recommended eliminating the boulder toe openings and outlet of the rock channel to make sure the wetlands areas are fully saturated (based on project performance of a similar City project). Subsequently, the rock channel material is also unnecessary, since the area will now be saturated due to elimination of the boulder toe openings. The rock material originally was intended to retard water movement within the rock channel allowing the water time to permeate laterally into the adjacent soils as it flowed through the wetland area and back into the main channel. The elimination of the rock channel outlet and boulder toe openings greatly increases the ability of the wetland area to maintain a higher wetland water elevation, to allow greater wetland soil saturation (downward through the soil instead of laterally), to sustain wetland plants, and to release excess water.

   These changes are considered an operational and environmental improvement to the originally authorized design and mitigation.

4. The authorization is amended as follows:

   a. The method of diverting the water to the wetland site will be modified by constructing an inlet and pipe to replace the grout trough.

   b. The boulder toe openings and outlet of the rock channel will be eliminated to more fully saturate the wetland areas.

   c. The rock channel material will be eliminated. Saturation of the wetland area will occur more naturally downward through the soils as the depressed area fills with water. With the boulder toe openings eliminated, excess water will simply seep naturally over the boulder toe into the pilot channel.

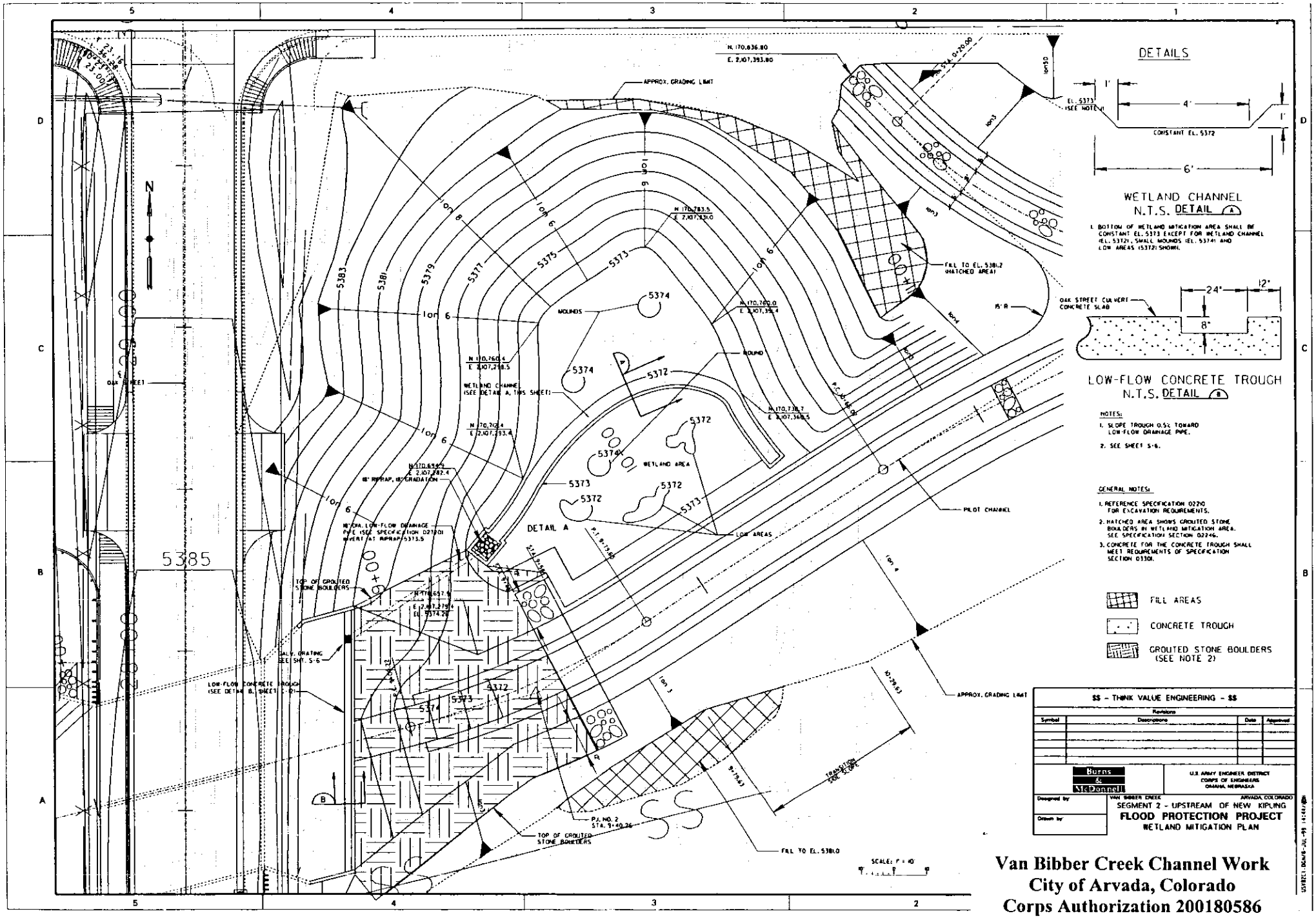
   d. Design changes are shown in Amendment 1, Figs. 24 and 25 which replace original Figs. 24 and 25.

5. Because of delays in Real Estate acquisition for the project, the original expiration date of January 31, 2005 for this authorization has been extended one year. **The new authorization expiration date is January 31, 2006.**

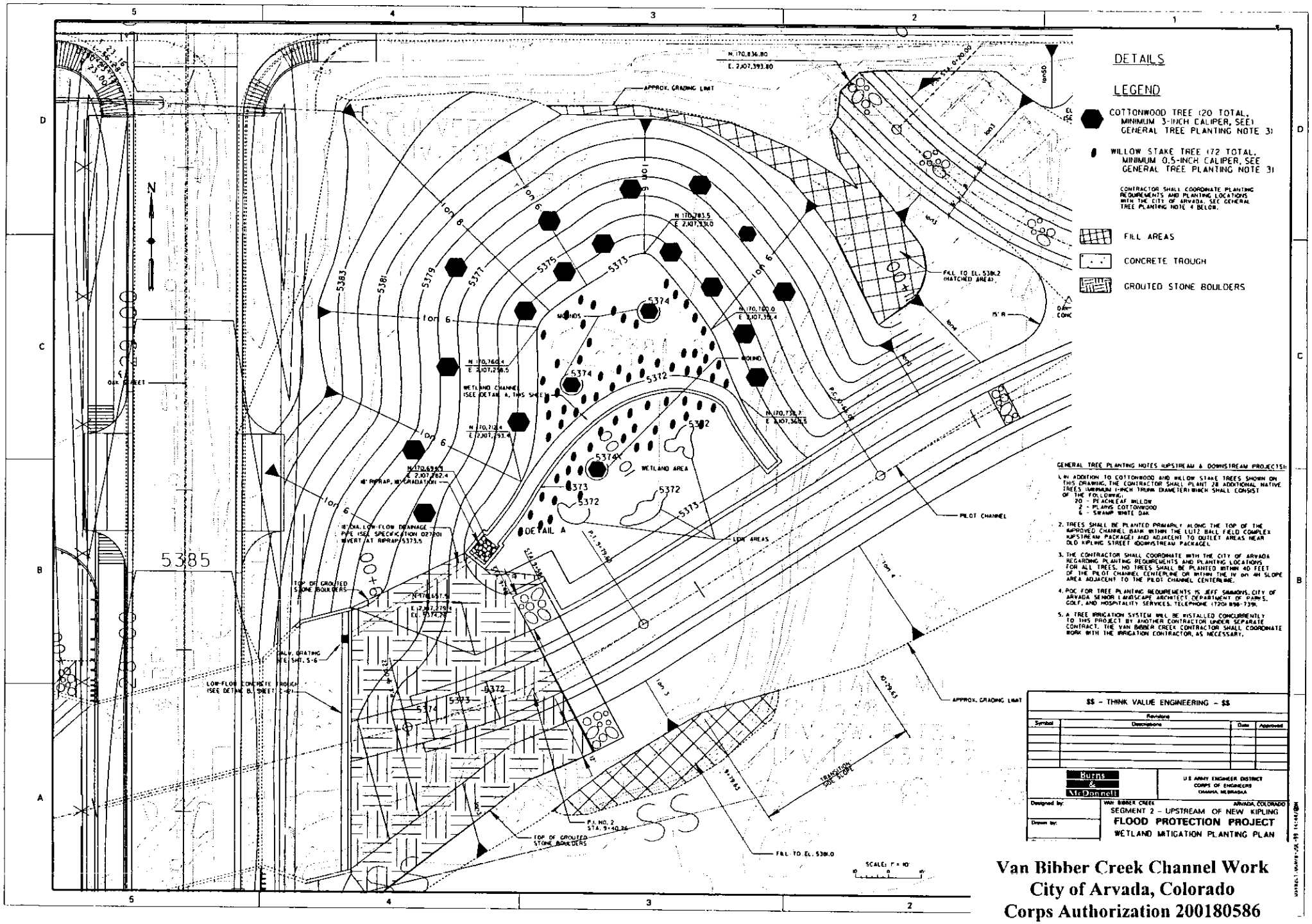
6. All other terms and conditions of the original authorization remain in full force and effect.

Timothy T. Carey
Chief, Denver Regulatory Office

200180586.amendment1.doc



Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization 200180586
Amendment 1, Fig. 24



Van Bibber Creek Channel Work
City of Arvada, Colorado
Corps Authorization 200180586
Amendment 1, Fig. 25

RM

CITY OF ARVADA
8101 Ralston Road
P.O. Box 8101
Arvada, CO 80001-8101
303-431-3033

LETTER OF TRANSMITTAL

DATE: May 21, 2002

TO: Bob Mattson, Project Manager
US Army Corps of Engineers - Omaha District
CENWO - PM - AP
106 S. 15th Street
Omaha, NE 68102-1618

SUBJECT: Van Bibber Drainage
Project No. 02-DR-40 (88-DR-06)

Enclosed is the approved Flood Plain Development Permit the city issued to itself for the Van Bibber Project. Please forward it onto the appropriate person in your area . Thanks

SIGNED:

Patrick E. Dougherty

Dept. Engineering Ext. 3321

ACTION REQUESTED:

( ) Please Handle
( ) For Your Signature
( ) Please Contact Me
( ) For Your Approval
( ) For Your Information
( ) For Your Files
( ) For Your Review & Comments
(X) As You Requested
( )
( ) Copy

( ) PLEASE RETURN

CITY OF ARVADA
8101 RALSTON ROAD
ARVADA, CO 80002
303-421-2550

ENGINEERING DIVISION
No. 2002-FLD-16
$20.00 Processing Fee
Paid NA
Date

APPLICATION FOR FLOOD PLAIN DEVELOPMENT PERMIT

This application is to be used when requesting a Flood Plain Development Permit from the City Engineer concerning proposed construction in the Flood Regulatory District which includes the Flood Zone District and Flood Way District in accordance with Ordinance 2881.

The applicant is required to fill in all information indicated on Pages One and Two of this application and to submit the completed application to the City Engineer. Normal time required for processing of this application shall be five working days.

APPLICANT TO COMPLETE THE FOLLOWING:

NAME CITY of ARVADA (Owner) (Attorney, Engineer, Contractor, etc.)

ADDRESS 8101 RALSTON

PHONE NUMBER 303-421-2550

ADDRESS/LOCATION OF REQUEST VAN BIBBER CREEK - OAK ST. TO CONFLUENCE WITH RALSTON CREEK

FLOOD PLAIN DEVELOPMENT REQUEST

JOINT PROJECT WITH US ARMY CORPS of ENGINEERS AND URBAN DRAINAGE AND FLOOD CONTROL DIST TO CONTROL FLOOD FLOWS ON VAN BIBBER CREEK. 50-YR COE W/ FREEBOARD = FEMA 100-YR NO FREE BOARD.

PROJECT CONSISTS of OPEN CHANNEL FROM OAK ST. TO 1300 LF DOWNSTREAM of KIPLING PARKWAY. THEN NORTHEASTERLY TO THE CONFLUENCE WITH RALSTON CREEK IN A DOUBLE 9'½ x 14½' BOX

HYDROLOGY + HYDRAULIC REPORTS AND CONSTRUCTION DRAWINGS ALL PREPARED BY THE CORPS of ENGINEERS ARE FILED UNDER ARVADA ENGINEERING DIV. FILES 02-DR-40 (88-DR-06)

(Please attach sketch of proposed construction on a plot plan)

Application for Flood Plain Development Permit No. 2002-FLD-16

LEGAL DESCRIPTION

LOT NUMBER _____ BLOCK NUMBER _____ ZONING _____

SUBDIVISION _____ FILING _____

LOT WIDTH _____ LOT DEPTH _____ AREA _____

METES AND MOUNDS DESCRIPTION ATTACHED: YES _____ NO _____

SETBACKS FROM PROPERTY LINES (Circle Front) N _____ S _____ E _____ W _____

APPLICANT'S CERTIFICATE:

I do hereby swear that to the best of my knowledge and belief, all information supplied with this application is true and accurate.

DATE 5-14-02 APPLICANT Patrick E Dougherty, Project Engineer

OFFICIAL USE ONLY

LOCATED IN FLOOD WAY: YES X NO _____

LOCATED IN FLOOD ZONE AREA OF: VAN BIBBER AND RALSTON CREEKS

APPROXIMATE 100 YEAR FLOOD ELEVATION REFER TO ~~REPORTS~~ FLOOD PROTECTION ELEVATION _____

EXISTING FIRST FLOOR ELEVATION NA OTHER PERTINENT EXISTING ELEVATION _____

ENGINEERING DIVISION COMMENTS: _____

BUILDING DEPARTMENT COMMENTS: _____

PLANNING DEPARTMENT COMMENTS: _____

FLOOD PLAIN ADMINISTRATOR'S ACTION:

A FLOOD PLAIN DEVELOPMENT PERMIT IS HEREBY Granted (Granted or Denied)

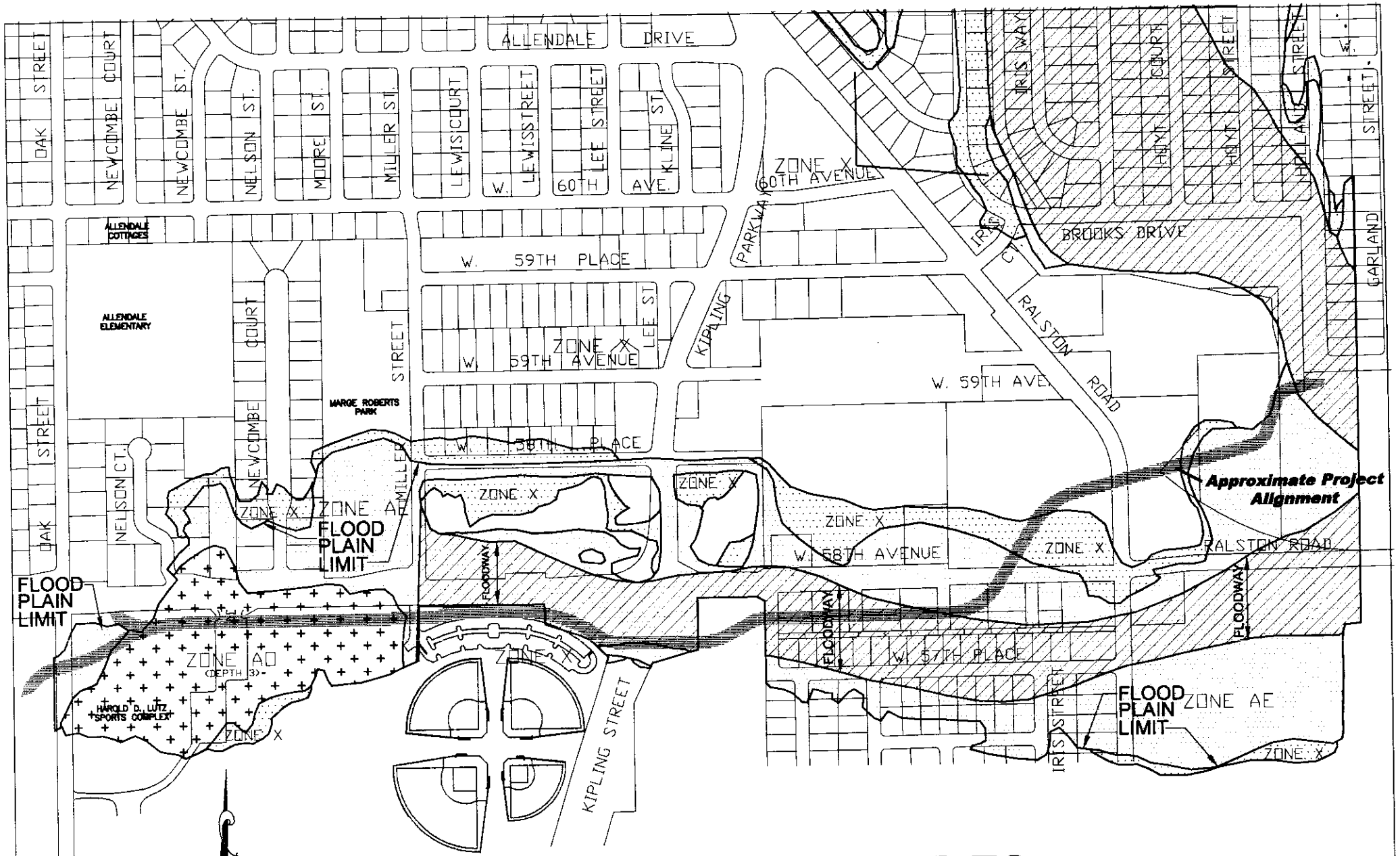
FOR: CONSTRUCTION of OPEN CHANNEL AND BOX CULVERT

ADDRESS: VAN BIBBER CREEK - ~~[illegible]~~ OAK ST TO CONFLUENCE WITH RALSTON CREEK

SPECIAL CONDITIONS WHICH MUST BE MET: BUILD ACCORDING TO CORPS of ENGINEERS PLANS

DATE: 5/20/02 SIGNATURE James E Root (Flood Plain Administrator)

2/92
FPDP



VAN BIBBER CRK.- OAK ST. TO CONFLUENCE W/RALSTON CRK.

CASE NO. 2002-FLD-16

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES

11/01

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL
1.3 SUBMITTALS
1.4 EROSION AND SEDIMENT CONTROLS
1.4.1 Stabilization Practices
1.4.1.1 Permanent Seeding
1.4.1.2 Temporary Seeding and Mulching
1.4.1.3 Erosion Control Blankets
1.4.2 Temporary Structural Practices
1.4.2.1 Silt Fences
1.4.2.2 Storm Drain Inlet Protection
1.4.2.3 Culvert Inlet Protection
1.4.2.4 Rock Check Dams
1.4.2.5 Stone Construction Entrance
1.4.2.6 Sediment Trap
1.4.2.7 Diversion Dikes

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES
2.1.1 Geotextile
2.1.2 Silt Fence Stakes and Posts
2.1.3 Mill Certificate or Affidavit
2.1.4 Identification Storage and Handling
2.1.5 Support Mesh
2.2 Erosion Control Blankets
2.3 COMPONENTS FOR SEDIMENT TRAP
2.4 COMPONENTS FOR INLET PROTECTION
2.5 STONE CONSTRUCTION ENTRANCE
2.6 ROCK CHECK DAMS
2.7 GEOTEXTILES

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES
3.2 Sediment Trap
3.3 Stone Construction Entrance
3.4 MAINTENANCE
3.4.1 Silt Fences
3.4.2 Storm Drain Inlet Protection
3.4.3 Rock Check Dams
3.4.4 Stone Construction Entrance
3.4.5 Sediment Traps
3.4.6 Diversion Dikes

3.5 INSPECTIONS
3.5.1 General
3.5.2 Inspections Details
3.5.3 Inspection Reports

-- End of Section Table of Contents --

SECTION 01356

STORM WATER POLLUTION PREVENTION MEASURES
11/01

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 448	(1998) Sizes of Aggregate for Road and Bridge Construction
ASTM D 4873	(2001) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 288	(2000) Geotextile for Highway Applications

1.2 GENERAL

The Contractor shall implement the storm water pollution prevention measures specified in this section in a manner which will meet the requirements of Section 01355 ENVIRONMENTAL PROTECTION, and the requirements of the National Pollution Discharge Elimination System (NPDES) permit specified in Section 01568__ NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES. The Contractor shall install and maintain stabilization and structural best management practices which will minimize erosion and sediment pollution from the construction site to the extent attainable. The Contractor shall be responsible for selection of appropriate best management practices as specified herein.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not haveing a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Mill Certificate or Affidavit

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.4.1 Stabilization Practices

The stabilization practices to be implemented may include temporary seeding, mulching, sod stabilization, vegetative buffer strips, erosion control blankets, protection of trees, preservation of mature vegetation, etc. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

1.4.1.1 Permanent Seeding

Disturbed areas of the site where construction activities permanently ceases shall be stabilized with permanent seeding no more than 14 days after the construction activity ceases, except as follows. When the initiation of permanent seeding is stopped due to snow cover or arid conditions, permanent seeding shall be initiated as soon as practicable.

1.4.1.2 Temporary Seeding and Mulching

Areas where construction activities will temporarily cease for more than one year shall be temporarily seeded and mulched. Disturbed areas of the site where construction activities temporarily cease for more than 21 days and less than one year shall be stabilized with either temporary seeding and mulching or mulching not more than 14 days after construction activity ceases, except as follows. When the initiation of temporary stabilization measures is stopped due to snow cover or arid conditions, stabilization measures shall be initiated as soon as practicable.

1.4.1.3 Erosion Control Blankets

Erosion control blanket may be installed on steep slopes and in drainage swales and ditches to protect finished grades from erosion.

1.4.2 Temporary Structural Practices

Temporary structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Temporary structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Temporary structural practices shall include but not be limited to the following devices.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fence barriers shall be installed along the down slope boundary of all disturbed areas prior to begining land-distrubing activities in those areas. Silt fence barriers may be installed across ditches or swales but not where the drainage area is greater than 1 acre. Removal of silt fence barriers shall be approved by the Contracting Officer.

1.4.2.2 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed at each new and existing

inlet which receives storm runoff from disturbed areas of 1 acre of less. The protection at each inlet shall be removed once the disturbed area has been finally stabilized.

1.4.2.3 Culvert Inlet Protection

Culvert inlet protection shall be installed at all culverts with a drainage area of 1 acre or less.

1.4.2.4 Rock Check Dams

Rock check dams may be used to reduce erosion of temporary or permanent ditches or swales. Type 1 rock check dams shall be used when the upstream drainage area is less than 2 acres. Type 2 rock check dams shall be used when the upstream area is 2 to 10 acres.

1.4.2.5 Stone Construction Entrance

A stone construction entrance shall be constructed wherever traffic will be leaving the construction site and move directly onto a paved road. Stone construction entrances shall be removed after the site has been finally stabilized.

1.4.2.6 Sediment Trap

Sediment traps may be constructed below disturbed areas where the total contributing drainage area is less than 3 acres. Sediment traps, when used, should be constructed prior to disturbance of upslope areas. Sediment traps must have an initial storage volume of 134 cubic yards per acre of drainage area, half of which shall be in the form of a permanent pool or wet storage to provide a stable settling medium. The remaining half shall be in the form of a drawdown or dry storage which will provide extended settling time during less frequent, larger storm events.

1.4.2.7 Diversion Dikes

Diversion dikes may be constructed to divert runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabiilized outlet or to divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin. Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic.

PART 2 PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Geotextile

The geotextile shall comply with the requirements of AASHTO M 288 for temporary silt fence.

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence

construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the geotextile and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile.

2.1.4 Identification Storage and Handling

Geotextile shall be identified, stored and handled in accordance with ASTM D 4873.

2.1.5 Support Mesh

Support mesh shall be 14-1/2 gage or heavier steel wire with a mesh spacing of 6 by 6 inch or a prefabricated polymeric mesh of equivalent strength.

2.2 Erosion Control Blankets

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on each side. The blanket shall be sewn together with degradable thread. Installation staple patterns shall be clearly marked on the erosion control blanket with environmentally safe paint.

2.3 COMPONENTS FOR SEDIMENT TRAP

Coarse aggregate shall conform to ASTM D 448, Size 3, 357, or 5. Minor variations from the gradations specified will be permitted. Stone for riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering. The specific gravity of individual stones shall be at least 2.5. Riprap stones shall weigh between 50 and 150 pounds each, except that approximately 10 percent may weigh 50 pounds or less. At least 60 percent shall weight more than 100 pounds. Geotextile shall conform to paragraph GEOTEXTILES.

2.4 COMPONENTS FOR INLET PROTECTION

Aggregates for gravel filter should be sized to get the greatest amount of filtering action possible (by using smaller-sized stone), while not creating significant ponding problems.

2.5 STONE CONSTRUCTION ENTRANCE

Aggregate for construction entrance shall conform to ASTM D 448, Size 1. Minor variations from the gradation specified will be permitted. Geotextile shall conform to paragraph GEOTEXTILES.

2.6 ROCK CHECK DAMS

Coarse aggregate shall conform to ASTM D 448 size number 1 or approved equal. Riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. Riprap shall be hard and angular. The specific gravity of individual stones shall be at least 2.5. Concrete rubble may be used provided it has a density of at least 150 pcf. Individual stones shall have a weight of 50 to 150 lbs except that a maximum of 10 percent of stone may weigh less than 50 lbs. At least 60 percent of stones shall weigh more than 100 lbs.

2.7 GEOTEXTILES

Geotextile for other than silt fence shall comply with the requirements of AASHTO M 288 for a separation geotextile.

PART 3 EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 6 inches wide and 8 inches deep on the upslope side of the location of the silt fence. The 6-inch by 8-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.

3.2 Sediment Trap

The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. Fill material for the embankment shall be placed in accordance with Section 02300 EARTHWORK. A geotextile shall be placed between the riprap and subgrade.

3.3 Stone Construction Entrance

The area of the entrance shall be cleared of all vegatation, roots, and other objectionable material. The aggregate layer shall have a minimum total thickness of 6 inches. A geotextile shall be placed beneath aggregate for the full width and length of the entrance. A minimum of 3 inches of the aggregate shall be placed in a cut section to provide stability and secure the geotextile. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, then the tires of the vehicles shall be washed before entering the road. Wash water must be carried away from the entrance to an approved settling area to remove sediment. A wash rack may also be installed for washing of vehicles.

3.4 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed

vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.4.1 Silt Fences

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 02921 SEEDING.

3.4.2 Storm Drain Inlet Protection

Inlet protection structures shall be inspected after each rainfall and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth.

3.4.3 Rock Check Dams

Check dams should be checked for sediment after each runoff-producing sotrm event. Sediment should be removed when it reaches one half the original height of the measure.

3.4.4 Stone Construction Entrance

Stone construction entrances shall be maintained in a conditon which will prevent tracking or flow of mud onto paved roads. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

3.4.5 Sediment Traps

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Filter stone shall be regularly checked to ensure that filtration performance is maintained. Stone choked with sediment shall be removed and cleaned or replaced. The structure should be inspected regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipement. The height of the stone outlet should be inspected to ensure that its center is a least 1 foot below the top of the embankment.

3.4.6 Diversion Dikes

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an

acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with Section 02935 SEEDING.

3.5 INSPECTIONS

3.5.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.5.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.5.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention measures, maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01400

SPECIAL SAFETY REQUIREMENTS

05/00 Rev 12/01

PART 1 GENERAL

1.1 REFERENCES
1.2 SUMMARY
1.2.1 General
1.3 PRECONSTRUCTION CONFERENCE
1.4 SUBMITTALS
1.5 ACCIDENT PREVENTION PLAN
1.5.1 Requirements
1.5.1.1 Responsible Individual(s)
1.5.1.2 Subcontractor Supervision
1.5.1.3 Indoctrination of New Employees
1.5.1.4 Tool Box Safety Meetings
1.5.1.5 Fire Prevention and Protection
1.5.1.6 Housekeeping
1.5.1.7 Mechanical Equipment Inspection
1.5.1.8 First Aid and Medical Facilities
1.5.1.9 Sanitation
1.5.1.10 Safety Promotions
1.5.1.11 Accident Reporting
1.5.1.12 Job Hazard Analysis
1.6 EXCAVATION AND TRENCHING

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section Table of Contents --

SECTION 01400

SPECIAL SAFETY REQUIREMENTS
05/00 Rev 12/01

PART 1 GENERAL

1.1 REFERENCES

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

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1926	Safety and Health Regulations for Construction

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996 and Changes) Safety and Health Requirements Manual

1.2 SUMMARY

1.2.1 General

This section provides guidelines for preparation of accident prevention plans, and to implement the accident prevention clause (this specification) and EM 385-1-1, Safety and Health Requirements Manual. The U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 is available from U.S. Government bookstores operated by the Government Printing Office and a copy is included on the CD-ROM issued with this solicitation. Changes to EM 385-1-1 applicable to this contract include only those revisions posted at the following website (all revisions up to the time this solicitation is issued): http://www.hq.usace.army.mil/soh/hqusace_soh.htm ("Changes to EM"). U.S. Government bookstores are located in most major cities including Milwaukee, Chicago, Kansas City, Denver, and Pueblo, Colorado.

1.3 PRECONSTRUCTION CONFERENCE

See Contract Clause "PRECONSTRUCTION CONFERENCE". A preconstruction conference will be scheduled prior to beginning of site work. Requirements relative to planning and administration of the overall safety program will be discussed.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan; G-AO

The written site-specific Accident Prevention Plan.

SD-07 Certificates

Qualifications; G-AO.

A written report providing evidence of qualifications for personnel, facilities and equipment assigned to the work.

1.5 ACCIDENT PREVENTION PLAN

The Contractor shall submit, prior to the start of on site construction activity, a proposed accident prevention plan which shall be the accident prevention policy to be followed by all of the Contractor's and subcontractor's personnel and supervisory staff during performance of the work.

1.5.1 Requirements

The proposed plan shall be developed after a careful analysis of the work involved and shall be tailored specifically to the conditions of this project. The Contractor's accident prevention plan shall contain, as a minimum, the following general information or procedures for the activity indicated. The Contractor shall submit his plan for review and acceptance prior to commencing work.

1.5.1.1 Responsible Individual(s)

The Contractor shall designate an onsite employee as the individual responsible for insuring the accident prevention plan is implemented and enforced.

1.5.1.2 Subcontractor Supervision

Explain procedures to assure that subcontractor(s) fully comply with the accident prevention plan.

1.5.1.3 Indoctrination of New Employees

The plan shall include provisions for advising workers of the purpose of the accident prevention plan, specific hazards on the job and precautions to be taken, emergency procedures, information concerning tool box safety meetings, required protective equipment, cleanup rules and location of company safety rules (posting or handout).

1.5.1.4 Tool Box Safety Meetings

Hold weekly "Tool Box" safety meetings. Timely safety subjects shall be determined by a responsible individual. Employees will be informed of time, location, who will conduct, and subject. Identify procedures for including subcontractors. The Contractor shall provide a copy of the Weekly Tool Box Meeting and Monthly Supervisor's Safety Meeting to the Contracting Officer.

1.5.1.5 Fire Prevention and Protection

Identify source of fire protection. Insure adequate fire extinguishers, water barrels, or other fire-fighting equipment is located on site. Explain prevention activities to include storage areas and special hazards such as welding and use of flammable liquids, and other special hazards.

1.5.1.6 Housekeeping

Daily cleanup of all debris and waste materials is required. Adequate disposal containers should be placed strategically around the site. Debris shall be removed on a regular basis. Explain procedures that include use of barrels, dumpsters, trash chutes, etc.

1.5.1.7 Mechanical Equipment Inspection

All mechanical equipment (trucks, cranes, forklifts, backhoes, graders, etc.) shall be inspected prior to use and at fixed intervals throughout the life of the contract. Explain how inspections will be accomplished (frequency, by whom, and records to be kept).

1.5.1.8 First Aid and Medical Facilities

First aid facilities shall be made available on the job site. Arrangements for emergency medical attention shall be made prior to start of work. All emergency numbers (doctor, hospital, ambulance, fire department) shall be posted at the project superintendent's office.

1.5.1.9 Sanitation

Include provisions for toilet facilities, drinking water and washing facilities. A sufficient number of toilet facilities as specified in EM 385-1-1 shall be provided unless permission is granted to use existing facilities (portable chemical are authorized). Insure safe drinking water and individual cups are available. For the projects where corrosive or toxic materials are used, separate washing facilities are required.

1.5.1.10 Safety Promotions

The Contractor shall promote accident prevention. Identify method (posters, awards etc.).

1.5.1.11 Accident Reporting

All accidents (employee injuries, vehicle, building, or equipment damage etc.) regardless of their severity, shall be reported to the onsite government representative or to the area engineer, who in turn will advise the Contractor of forms to be submitted and timeframes.

1.5.1.12 Job Hazard Analysis

When job situations change and it is necessary to alter safety requirements, a Job Hazard Analysis will be accomplished, documented, and added as an addendum to the Accident Prevention Plan. Each Job Hazard Analysis shall include, but not be limited to, a description of the work, probable hazards related to that work and positive precautionary measures to be taken to reduce or eliminate each hazard. An example of changing situations may be new subcontractors performing work such as earth moving, trenching, concrete work, roofing, electrical, masonry etc. The onsite government representative will determine the format and amount of detail required of the written plan.

1.6 EXCAVATION AND TRENCHING

The standards for excavation and trenching are outlined in 29 CFR 1926, Subpart P. These standards shall be followed in addition to those outlined in EM 385-1-1.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01451A

CONTRACTOR QUALITY CONTROL

1/03; Omaha Revision 2/03

PART 1 GENERAL

1.1 REFERENCES
1.2 PAYMENT

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 QUALITY CONTROL PLAN
3.2.1 Content of the CQC Plan
3.2.2 Acceptance of Plan
3.2.3 Notification of Changes
3.3 COORDINATION MEETING
3.4 QUALITY CONTROL ORGANIZATION
3.4.1 Personnel Requirements
3.4.2 CQC System Manager
3.4.3 CQC Personnel
3.4.4 Additional Requirement
3.4.5 Organizational Changes
3.5 SUBMITTALS AND DELIVERABLES
3.6 CONTROL
3.6.1 Preparatory Phase
3.6.2 Initial Phase
3.6.3 Follow-up Phase
3.6.4 Additional Preparatory and Initial Phases
3.7 TESTS
3.7.1 Testing Procedure
3.7.2 Testing Laboratories
3.7.2.1 Capability Check
3.7.2.2 Capability Recheck
3.7.3 Onsite Laboratory
3.7.4 Furnishing or Transportation of Samples for Testing
3.8 COMPLETION INSPECTION
3.8.1 Punch-Out Inspection
3.8.2 Pre-Final Inspection
3.8.3 Final Acceptance Inspection
3.9 DOCUMENTATION
3.10 SAMPLE FORMS
3.11 NOTIFICATION OF NONCOMPLIANCE

-- End of Section Table of Contents --

SECTION 01451A

CONTRACTOR QUALITY CONTROL
1/03; Omaha Revision 2/03

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer shall be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

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

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times

during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties . An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The QC plan will clearly state the duties and responsibilities of each staff member. Other technical specifications may specify individuals for maintaining quality control for specific areas of work. These individuals shall be under the direction of the CQC System Manager.

3.4.4 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at each of the four area offices in the Omaha District according to the following revolving training schedule:.

Badger Area	First Session	Between 15 & 25 April
	Second Session	Between 15 & 25 October
Point of Contact	Roy Brewer	(319) 753-1386
Black Hills Area	First Session	Between 1 & 10 March
	Second Session	Between 1 & 10 September
Point of Contact	Dwight Pochant	(605) 923-2983
Fort Crook Area	First Session	Between 15 & 25 January
	Second Session	Between 15 & 25 July

Point of Contact	Al Kreisler	(402) 293-2540
Rocky Mountain	First Session	Between 1 & 10 June
	Second Session	Between 1 & 10 December
Point of Contact	Paul Jendzejec	(719) 556-4184

The exact date and location for the sessions will be determined approximately 30 days in advance of the training. The cost of training is presently established at $50 to be paid by each student in advance of the training. For information about a particular session, the best source is the point of contact listed above.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Prior to the preparatory meeting for each definable feature of work, the Contractor shall provide all technical references (i.e. building codes, life safety codes, etc.) referenced in the project specifications for feature(s) of work being addressed at the preparatory meeting. These technical references shall be onsite and available for use by Contractor and Government personnel before the preparatory meeting is held and maintained until the feature(s) of work is/are accepted by the Government.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

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

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and

disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed the actual cost for the recheck to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

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

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Resident or Area (as directed) Office.

For delivery by mail: Commander and Director
U.S. Army Engineer Waterways Experiment Station
Attn: CEWES-GS
3909 Hallsferry Road
Vicksburg, Mississippi 39180-6199

For other deliveries: Commander and Director
U.S. Army Engineer Waterways Experiment Station
Attn: CEWES-GS
3909 Hallsferry Road
Vicksburg, Mississippi 39180-6199

Coordination for each specific test, exact delivery location, and dates will be made through the Resident or Area (as directed) Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items

which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Contracting Officer's Representative on the first day following the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

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

_____
(FIRM NAME)

DAILY QUALITY CONTROL REPORT

Daily Report No.: _____ DATE: _____
Contract No. _____
Project Title & Location:
_____
Weather: ____ Precipitation: _____ in. _____ Temp:____ Min. ____ Max. ____

1. Contract/Subcontractors and Area of Responsibility:

NUMBER:	TRADE	HOURS	EMPLOYER	LOCATION/DESCRIPTION WORK

2. Operating Plant or Equipment. (Not hand tools)

Plant/Equipment	Date of Arrival/Departure	Date of Safety Check	Hours Used	Hours Idle	Hours Repair

3. Work Performed Today: (Indicate location and description of work performed by prime and/or subcontractors. When network analysis is used, identify work by NAS activity number).

4. Control Activities Performed:
   Preparatory Inspections: (Identify feature of work and attach minutes).
   Initial Inspections: (Identify feature of work and attach minutes).
   Follow-Up Inspections: (List inspections performed, results of inspection compared to specification requirements, and corrective actions taken when deficiencies are noted).

5. Tests Performed and Test Results: (Identify test requirement by paragraph number in specifications and/or sheet number in plans).

6. Material Received: (Note inspection results and storage provided).

7. Submittals Reviewed:

(a) Submittal No.	(b) Spec/Plan Reference	(c) By Whom	(d) Action

8. Offsite Surveillance Activities, Including Action Taken:

_____
_____
_____
_____
_____
_____
_____
_____

9. Job Safety: (List items checked, results, instructions and corrective actions taken).

_____
_____
_____
_____
_____
_____
_____
_____
_____

10. Remarks: (Instructions received or given. Conflict(s) in Plans and/or specifications. Delays encountered.).

_____
_____
_____
_____
_____
_____
_____

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as may be noted above.

_____

CQC System Manager Date

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01550

MEASUREMENT AND PAYMENT

6/2000

PART 1 GENERAL

1.1 CLEARING AND GRUBBING
1.1.1 Work Included
1.1.2 Measurement
1.1.3 Payment
1.2 EXCAVATION
1.2.1 Work Included
1.2.2 Measurement
1.2.3 Payment
1.3 COMPACTED EMBANKMENTS AND GRADING
1.3.1 Work Included
1.3.2 Measurement
1.3.3 Payment
1.4 TOPSOIL AND PLACEMENT OF ORGANIC WETLAND SOIL
1.4.1 Work Included
1.4.2 Measurement
1.4.3 Payment
1.5 SEEDING, MULCHING, AND PLANTINGS
1.5.1 Work Included
1.5.2 Measurement
1.5.3 Payment
1.6 RIPRAP AND GROUTED STONE BOULDER CONSTRUCTION
1.6.1 Work Included
1.6.2 Measurement
1.6.3 Payment
1.7 CONCRETE
1.7.1 Work Included
1.7.2 Measurement
1.7.3 Payment
1.8 BITUMINOUS PAVEMENT AND AGGREGATE BASE COURSE
1.8.1 Work Included
1.8.2 Measurement
1.8.3 Payment
1.9 WATER LINE RELOCATION
1.9.1 Work Included
1.9.2 Measurement
1.9.3 Payment
1.10 UTILITY MODIFICATIONS AND RELOCATIONS
1.10.1 Work Included
1.10.2 Measurement.
1.10.3 Payment
1.11 DEWATERING
1.11.1 Work Included
1.11.2 Measurement
1.11.3 Payment

1.12 ALL REMAINING WORK
1.12.1 Work Included
1.12.2 Measurement
1.12.3 Payment

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION(NOT APPLICABLE)

-- End of Section Table of Contents --

SECTION 01550

MEASUREMENT AND PAYMENT
6/2000

PART 1 GENERAL

1.1 CLEARING AND GRUBBING

1.1.1 Work Included

The work shall include all material, equipment and labor necessary to satisfactorily remove and dispose of all trees, clearing and disposing of vegetation and miscellaneous debris, prior to construction of embankments, the improved channel, the wetlands mitigation area, and any other areas that require clearing and grubbing, and hauling debris to suitable, licensed disposal areas outside the project right-of-way.

1.1.2 Measurement

Lump sum.

1.1.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.2 EXCAVATION

1.2.1 Work Included

The work shall include all material, equipment and labor necessary for excavation of the improved channel, drop structures, underground conduit, wetland mitigation area, water line relocation northeast of W. 58th Avenue and Independence Street, and all other areas where grading is required as shown on the drawings. Excavation shall be accomplished by conventional mechanical methods. Excavation shall also include removal of organic, wetland soil from Van Bibber Creek immediately upstream of the Oak Street Culvert for placement in the wetland mitigation area shown on drawings C-12 and C-13 of the upstream package. Reference specification section 02210.

1.2.2 Measurement

Lump sum.

1.2.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.3 COMPACTED EMBANKMENTS AND GRADING

1.3.1 Work Included

The work shall include all material, equipment and labor necessary to construct improved channel embankments, compacted fill adjacent to and beneath the underground conduit, grading work associated with the shoofly detour, and all other areas requiring grading and compacted fill, as shown on drawings. The work shall include hauling, spreading, compaction, water for compaction, and all other necessary operations to shape and build compacted embankments and compacted fill areas.

1.3.2 Measurement

Lump sum.

1.3.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.4 TOPSOIL AND PLACEMENT OF ORGANIC WETLAND SOIL

1.4.1 Work Included

The work shall include all materials, equipment and labor to complete all items of work, including excavation, stockpiling, hauling, placing, compaction, and maintenance of topsoil in areas shown on the drawings and specified herein, such as completed sections of the improved channel and adjacent areas shown on the drawings. The work shall also include placement of organic, wetland soil in the wetland mitigation area.

1.4.2 Measurement

Lump sum.

1.4.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.5 SEEDING, MULCHING, AND PLANTINGS

1.5.1 Work Included

This work shall include but not be limited to all materials, equipment, labor and all other incidental work needed for seeding and mulching to complete the requirements according to the drawings and specifications. The work shall also include materials, equipment, labor and all other incidental work needed to plant willow stake and cottonwood trees in the wetland mitigation area, and additional native trees along the improved channel. Reference specification sections 02915, 02921, 02930, and the drawings for requirements.

1.5.2 Measurement

Lump sum.

1.5.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.6 RIPRAP AND GROUTED STONE BOULDER CONSTRUCTION

1.6.1 Work Included

The work shall include all materials, equipment and labor of furnishing, hauling, handling and placing riprap, grouted stone boulders, bedding materials including any geotextile, and grout for riprap and grouted stone boulders as specified herein and shown on the drawings.

1.6.2 Measurement

Lump sum.

1.6.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.7 CONCRETE

1.7.1 Work Included

The work shall include all materials, equipment and labor of furnishing, hauling, handling, placing, and finishing concrete for the aboveground concrete channel, drop structures, culverts, wingwalls, bridges, underground concrete conduit, concrete pavement, curb, gutter, sidewalks, and other incidental concrete work as shown on the drawings. The work shall also include reinforcing steel shown on the drawings, and installation of bedding or drain blanket materials beneath concrete structures as shown on the drawings.

1.7.2 Measurement

Lump sum.

1.7.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.8 BITUMINOUS PAVEMENT AND AGGREGATE BASE COURSE

1.8.1 Work Included

The work shall include all materials, equipment and labor of furnishing, hauling, handling, placing, and finishing bituminous pavement and aggregate base course for pavement restoration and replacement as shown on the drawings. Work shall also include pavement striping and markings shown on the drawings, and bituminous pavement replacement within excavation limits of the water line relocation shown on drawing U-3 of the downstream package.

1.8.2 Measurement

Lump sum.

1.8.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.9 WATER LINE RELOCATION

1.9.1 Work Included

The work shall include all materials, equipment and labor necessary to remove and properly dispose of the existing 6" and 8" diameter water line and related appurtenances located near the southeast corner of the Safeway Store, northeast of W. 58th Avenue and Independence Street. The work shall also include materials, equipment and labor necessary to install, flush, chlorinate and test the relocated section of 8" diameter water line. Measurement and payment for excavation shall be included in Paragraph 1.2. Measurement and payment for bituminous pavement replacement shall be included in Paragraph 1.8.

1.9.2 Measurement

Lump sum.

1.9.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.10 UTILITY MODIFICATIONS AND RELOCATIONS

1.10.1 Work Included

The work shall include all materials, equipment and labor necessary to modify or relocate storm sewer, sanitary sewer, water, gas, telephone, cable television, and any other utilities shown on the drawings to be removed, abandoned, modified, or relocated. Work to relocate the 6" and 8" diameter water mains near the southeast corner of the Safeway Store, northeast of W. 58th Avenue and Independence Street shall be included in pay item 1.9.

1.10.2 Measurement.

Lump sum.

1.10.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.11 DEWATERING

1.11.1 Work Included

The work shall include all material, equipment and labor necessary to dewater subsurface soils and the diversion and care of water to maintain excavation structural integrity during construction of the underground conduit.

1.11.2 Measurement

Lump sum.

1.11.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

1.12 ALL REMAINING WORK

1.12.1 Work Included

The work for this item shall include but not be limited to labor and equipment needed to complete all remaining work not covered under bid items 1.1 through 1.11, listed above.

1.12.2 Measurement

Lump sum.

1.12.3 Payment

Payment for this item shall be the lump sum applied on a progressive basis depending on the percentage of work completed.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION(NOT APPLICABLE)

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01568

(NON-FEDERAL FACILITIES COLOARDO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGE FROM CONSTRUCTION SITES

07/00

PART 1 GENERAL

1.1 SUBMITTALS

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 GENERAL
3.2 IMPLEMENTATION
3.2.1 General Permit Application
3.2.2 Stormwater Management Plan
3.2.3 Inspections and Reporting
3.2.4 Maintenance
3.2.5 Inactive Notice
3.2.6 Retention of Records
3.2.7 Continuation of Expired Permit

-- End of Section Table of Contents --

SECTION 01568

(NON-FEDERAL FACILITIES COLOARDO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGE FROM CONSTRUCTION SITES

07/00

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation . The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-05 Design Data

General Permit Application;

Stormwater Management Plan; G-DO

Inactivation;

SD-06 Test Reports

Inspection Report;

PART 2 PRODUCTS

Not applicable.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall be responsible for implementing the terms and requirements of the attached "Authorization To Discharge Under The Colorado Discharge Permit System" CDPS General Permit for storm water discharges from construction sites and the Stormwater Management Plan (SWMP). The Contractor shall be considered the "permittee". All submissions to the State shall be by certified mail. Copies of the return receipt for each submission shall be included with the submittal to the Contracting Officer's Representative (COR).

3.2 IMPLEMENTATION

3.2.1 General Permit Application

The Contractor shall complete and submit a General Permit Application in accordance with the CDPS general permit. A copy of the submitted General Permit Application shall be furnished to the COR at least 10 days prior to

the commencement of construction activities. The Contractor shall be responsible for payment of all permit fees.

3.2.2 Stormwater Management Plan

The Contractor shall prepare, submit and implement a Stormwater Management Plan (SWMP) in accordance with the CDPS general permit. Any temporary or permanent erosion and sedimentation control measures shown on the drawings shall be incorporated into the Contractor's SWMP. A copy of the SWMP shall be submitted for approval at least 21 days prior to the commencement of construction activities.

3.2.3 Inspections and Reporting

The Contractor shall be responsible for all inspections and reporting required under the CDPS general permit. Copies of each Inspection Report shall be furnished to the COR.

3.2.4 Maintenance

The Contractor shall be responsible for maintaining all erosion and sediment control measures and other protective measures identified in the SWMP in an effective operating condition. The Government reserves the right to require the Contractor to perform maintenance on erosion and sediment control measures and other protective measures if the COR determines that environmental protection requirements are not being met.

3.2.5 Inactive Notice

The Contractor shall complete and submit an Inactivation Notice in accordance with the CDPS general permit. A copy of the submitted Inactivation Notice shall be furnished to the COR.

3.2.6 Retention of Records

The Contractor shall retain copies of the SWMP and all reports in accordance with the CDPS general permit.

3.2.7 Continuation of Expired Permit

If the current CDPS general permit expires prior to completion of construction, the Contractor shall comply with the conditions of the new permit.

-- End of Section --

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH
CONSTRUCTION ACTIVITY

AUTHORIZATION TO DISCHARGE UNDER THE

COLORADO DISCHARGE PERMIT SYSTEM

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with construction activities certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State. Such discharges shall be in accordance with the conditions of this permit.

This permit specifically authorizes the facility listed on page 1 of this permit to discharge stormwater associated with construction activity, as of this date, in accordance with permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit and the authorization to discharge shall expire at midnight, **June 30, 2002.**

Issued and Signed this day of JUN 0 2 1997

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

David Akers

for J. David Holm, Director
Water Quality Control Division

TABLE OF CONTENTS

PART I

A. COVERAGE UNDER THIS PERMIT . . . 3
1. Authority to Discharge . . . 3
2. Industries Covered Under this Permit . . . 3
a) Definitions: . . . 3
b) Types of Activities Covered by this Permit: . . . 3
3. Application, Due Dates . . . 3
a) Application Due Dates . . . 3
b) Summary of Application . . . 3
4. Permit Certification Procedures . . . 4
a) Request for Additional Information . . . 4
b) Automatic Coverage . . . 4
c) Individual Permit Required . . . 4
d) Temporary Coverage . . . 4
e) General vs. Individual Permit Coverage . . . 4
f) Local Agency Authority . . . 4
5. Inactivation Notice . . . 4
6. Transfer of Permit . . . 4
7. Permit Expiration Date . . . 5
8. Individual Permit Criteria . . . 5

B. CONTENTS OF THE STORMWATER MANAGEMENT PLAN . . . 5
1. Site Description . . . 6
2. Site Map . . . 6
3. BMPs for Stormwater Pollution Prevention . . . 6
a) Erosion and Sediment Controls . . . 6
b) Materials Handling and Spill Prevention. . . . 7
4. Final Stabilization and Longterm Stormwater Management . . . 7
5. Other Controls . . . 7
6. Inspection and Maintenance . . . 7

C. TERMS AND CONDITIONS . . . 7
1. General Limitations . . . 7
2. Specific Limitations . . . 8
3. Prohibition of Non-stormwater Discharges . . . 8
4. Releases in Excess of Reportable Quantities . . . 9
5. Stormwater Management Plans . . . 9
a) Signatory Requirements . . . 9
b) SWMP Review/Changes . . . 9
6. Inspections . . . 9
a) Active Sites . . . 9
b) Completed Sites . . . 9
c) Winter Conditions . . . 10
7. Reporting . . . 10
8. SWMP Submittal Upon Request . . . 10

D. ADDITIONAL DEFINITIONS . . . 10

E. GENERAL REQUIREMENTS . . . 11
1. Signatory Requirements . . . 11
2. Retention of Records . . . 12

TABLE OF CONTENTS (cont.)

PART II

A. MANAGEMENT REQUIREMENTS 12
1. Change in Discharge 12
2. Special Notifications - Definitions 12
3. Noncompliance Notification 12
4. Submission of Incorrect or Incomplete Information 13
5. Bypass 13
6. Upsets 13
7. Removed Substances 14
8. Minimization of Adverse Impact 14
9. Reduction, Loss, or Failure of Treatment Facility 14
10. Proper Operation and Maintenance 14

B. RESPONSIBILITIES 14
1. Inspections and Right to Entry 14
2. Duty to Provide Information 15
3. Transfer of Ownership or Control 15
4. Modification, Suspension, or Revocation of Permit By Division 15
5. Permit Violations 16
6. Legal Responsibilities 16
7. Severability 16
8. Renewal Application 17
9. Confidentiality 17
10. Fees 17
11. Requiring an Individual CDPS Permit 17

PART I

A. COVERAGE UNDER THIS PERMIT

1. Authority to Discharge

Under this permit, construction activities, including clearing, grading, and excavation, are granted authorization to discharge stormwater associated with construction activities into waters of the state of Colorado.

2. Industries Covered Under this Permit

a) Definitions:

1) Stormwater: Stormwater is precipitation-induced surface runoff.

2) Construction activity: Construction activity includes clearing, grading and excavation activities. Construction does not include routine maintenance performed by public agencies, or their agents to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

3) Other Definitions: Definitions of additional terms can be found in Part I.D. of this permit.

b) **Types of Activities Covered by this Permit:** This permit may authorize all new and existing discharges of stormwater associated with construction activity. This includes stormwater discharges from areas that are dedicated to producing earthen materials, such as soils, sand and gravel, for use at a single construction site. This permit also includes stormwater discharges from dedicated asphalt batch plants and dedicated concrete batch plants. This permit does not authorize the discharge of mine water or process water from such areas.

3. Application, Due Dates

a) **Application Due Dates:** At least ten days prior to the anticipated date of discharge, or by **October 1, 1992**, whichever is later, the operator of the construction activity shall submit an application form as provided by the Division, with a certification that the Stormwater Management Plan (SWMP) is complete.

One original completed discharge permit application shall be submitted, by mail or hand delivery, to:

Colorado Department of Public Health and Environment
WQCD-WQP-B2
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530
Attention: Permits Unit

b) **Summary of Application:** The application requires, at a minimum, the following:

1) The operator's name, address, telephone number, tax payer identification number (or employer identification number), and the status as Federal, State, private, public or other entity;
2) Name, county and location of the construction site, including the Township, Range, section and quarter section and the latitude and longitude to the nearest 15 seconds of the approximate center of the construction activity;
3) A brief description of the nature of the construction activity;
4) The anticipated starting date of the project and the anticipated schedule of completion
5) Estimates of the total area of the site, and the area of the site that is expected to be disturbed;
6) The name of the receiving water(s), or the municipal separate storm sewer system and the ultimate receiving water(s);
7) A list of any other environmental permits (including city or county grading permits) currently held for the site; and
8) Certification that the SWMP for the construction site is complete (see Part I.B. below).

A. COVERAGE UNDER THIS PERMIT (cont.)

9) The signature of the applicant signed in accordance with Part I.E.1 of this permit.

4. Permit Certification Procedures

If the general permit is applicable to the applicant's operation, then a certification will be developed and the applicant will be authorized to discharge stormwater under this general permit.

a) **Request for Additional Information:** The Division shall have up to **ten days** after receipt of the above information to request additional data and/or deny the authorization for any particular discharge. Upon receipt of additional information, the Division shall have an additional **ten days** to issue or deny authorization for the particular discharge. (Notification of denial shall be by letter, in cases where coverage under an alternate general permit or an individual permit is required, instead of coverage under this permit.)

b) **Automatic Coverage:** If the applicant does not receive a request for additional information or a notification of denial from the Division dated within ten days of receipt of the application by the Division, authorization to discharge in accordance with the conditions of this permit shall be deemed granted.

c) **Individual Permit Required:** If, after evaluation of the application (or additional information, such as the SWMP), it is found that this general permit is not applicable to the operation, then the application will be processed as one for an individual permit. The applicant will be notified of the Division's decision to deny certification under this general permit. For an individual permit, additional information may be requested, and 180 days will be required to process the application and issue the permit.

d) **Temporary Coverage:** Notwithstanding Parts I.A.4.a-c, above, the Division reserves the right to **temporarily** cover stormwater discharge from construction activity under general permits, even though individual permit coverage may be more appropriate.

Certification of these activities under a general permit does not in any way infringe on the Division's right to revoke that coverage and issue an individual permit or amend an existing individual permit.

e) **General vs. Individual Permit Coverage:** Any owner or operator authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual CDPS permit. The owner or operator shall submit an individual application, with reasons supporting the request, to the Division at least 180 days prior to any discharge.

f) **Local Agency Authority:** This permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.

5. Inactivation Notice

When a site has been finally stabilized in accordance with the SWMP, the operator of the facility must submit an **Inactivation Notice** that is signed in accordance with Part I.E.1. of this permit. The Inactivation Notice form is available from the Division and includes:

a) Permit certification number;
b) The permittee's name, address, telephone number;
c) Name, location, and county for the construction site for which the application is being submitted.
d) Certification that the site has been finally stabilized.

6. Transfer of Permit

When responsibility for stormwater discharges at a construction site changes from one individual to another, the

A. COVERAGE UNDER THIS PERMIT (cont.)

permittee shall submit a completed Notice of Transfer and Acceptance of Terms of a Construction General Stormwater Discharge Permit Certification that is signed in accordance with Part I.E.1. of this permit. The Notice of Transfer form is available from the Division and includes:

a) Permit certification number.
b) Name, location, and county for the construction site for which the application is being submitted.
c) The current permittee's name, address, telephone number and the status as Federal, State, private, public or other entity.
d) The new permittee's name, address and telephone number and the status as Federal, State, private, public or other entity.
e) Certification that the new permittee has reviewed the permit and SWMP and accepts responsibility, coverage and liability for the permit.
f) Effective date of transfer.

7. **Permit Expiration Date**

Authorization to discharge under this general permit shall expire on June 30, 2002. The Division must evaluate and reissue this general permit at least once every five years and must recertify the applicant's authority to discharge under the general permit at such time. Many permittees will have filed a Notice of Inactivation (see section A.5. above) by that time and will not be affected by permit expiration. Any permittee desiring continued coverage under the general permit must reapply by March 31, 2002. The Division will determine if the applicant may continue to operate under the terms of the general permit. An individual permit will be required for any facility not reauthorized to discharge under the reissued general permit.

8. **Individual Permit Criteria**

Aside from the activity type, the Division may use other criteria in evaluating whether an individual permit is required instead of this general permit. This information may come from the application, SWMP, or additional information as requested by the Division, and includes, but is not limited to, the following:

a) the quality of the receiving waters (i.e., the presence of downstream drinking water intakes or a high quality fishery, or for preservation of high quality water);
b) the size of the construction site;
c) evidence of noncompliance under a previous permit for the operation;
d) the use of chemicals within the stormwater system.

In addition, an individual permit may be required when the Division has shown or has reason to suspect that the stormwater discharge may contribute to a violation of a water quality standard.

B. CONTENTS OF THE STORMWATER MANAGEMENT PLAN

The SWMP shall be prepared in accordance with good engineering, hydrologic and pollution control practices. (The SWMP need not be prepared by a registered engineer.) The main objective of the plan shall be to identify Best Management Practices (BMPs) which when implemented will meet the terms and conditions of this permit (see Part I.C., below).

The plan shall identify potential sources of pollution (including sediment) which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the facility. In addition, the plan shall describe and ensure the implementation of BMPs which will be used to reduce the pollutants in stormwater discharges associated with construction activity. Construction operations must implement the provisions of the SWMP required under this part as a condition of this permit.

B. CONTENTS OF THE STORMWATER MANAGEMENT PLAN (cont.)

The SWMP shall include the following items, at a minimum:

1. Site Description

Each plan shall provide a description of the following:

a) A description of the construction activity.
b) The proposed sequence for major activities.
c) Estimates of the total area of the site, and the area of the site that is expected to undergo clearing, excavation or grading.
d) An estimate of the runoff coefficient of the site before and after construction activities are completed and any existing data describing the soil, soil erosion potential or the quality of any discharge from the site.
e) A description of the existing vegetation at the site and an estimate of the percent vegetative ground cover.
f) The location and description of any other potential pollution sources, such as vehicle fueling, storage of fertilizers or chemicals, etc.
g) The location and description of any anticipated non-stormwater components of the discharge, such as springs and landscape irrigation return flow.
h) The name of the receiving water(s) and the size, type and location of any outfall or, if the discharge is to a municipal separate storm sewer, the name of that system, the location of the storm sewer discharge, and the ultimate receiving water(s).

2. Site Map

Each plan shall provide a generalized site map or maps which indicate:

- construction site boundaries
- all areas of soil disturbance
- areas of cut and fill
- areas used for storage of building materials, soils or wastes
- location of any dedicated asphalt or concrete batch plants
- location of major erosion control facilities or structures
- springs, streams, wetlands and other surface waters
- boundaries of 100-year flood plains, if determined.

3. BMPs for Stormwater Pollution Prevention

The plan shall include a narrative description of appropriate controls and measures that will be implemented before and during construction activities at the facility.

The plan shall clearly describe the relationship between the phases of construction and the implementation and maintenance of controls and measures. For example, which controls will be implemented during each of the following stages of construction: clearing and grubbing necessary for perimeter controls, initiation of perimeter controls, remaining clearing and grubbing, road grading, storm drain installation, final grading, stabilization, and removal of control measures.

The description of controls shall address the following minimum components:

a) Erosion and Sediment Controls.

1) **Structural Practices.** A description of structural site management practices which will minimize erosion and sediment transport. Such practices may include: straw bales, silt fences, earth dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, and temporary or permanent sediment basins.

B. CONTENTS OF THE STORMWATER MANAGEMENT PLAN (cont.)

2) **Non-Structural Practices.** A description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where possible and that disturbed areas are stabilized. Non-structural practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, and preservation of mature vegetation.

b) Materials Handling and Spill Prevention.

The SWMP shall identify any procedures or significant materials (see definitions at Part I.D.) handled at the site that could contribute pollutants to runoff. These could include: exposed storage of building materials, fertilizers or chemicals; waste piles; and equipment maintenance or fueling procedures. Areas or procedures where potential spills can occur shall have spill prevention and response procedures identified.

Measures to control stormwater pollution from dedicated concrete batch plants or dedicated asphalt batch plants covered by this certification, must be identified in the SWMP.

4. **Final Stabilization and Longterm Stormwater Management**

A description of the measures used to achieve final stabilization and measures to control pollutants in stormwater discharges that will occur **after** construction operations have been completed.

Final stabilization is reached when all soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels or equivalent permanent, physical erosion reduction methods has been employed.

For purposes of this permit, establishment of a vegetative cover capable of providing erosion control equivalent to pre-existing conditions at the site can be considered final stabilization. The permittee will be responsible for providing to the Division the documentation to make this comparison. The Division may, after consultation with the permittee and upon good cause, amend the final stabilization criteria for specific operations.

5. **Other Controls**

A description of other measures to control pollutants in stormwater discharges including plans for waste disposal and limiting off site soil tracking.

6. **Inspection and Maintenance**

A description of procedures to inspect and maintain in good and effective operating condition the vegetation, erosion and sediment control measures and other protective measures identified in the SWMP.

C. TERMS AND CONDITIONS

1. **General Limitations**

Stormwater discharges from construction sites shall not cause or threaten to cause pollution, contamination or degradation of State waters in accordance with the basic (narrative) standards applicable to surface waters of the state (3.1.11), contained in The Basic Standards and Methodologies for Surface Water, 3.1.0, as follows:

C. TERMS AND CONDITIONS (cont.)

"BASIC STANDARDS APPLICABLE TO SURFACE WATERS OF THE STATE - All surface waters of the State are subject to the following basic standards; however, discharge of substances regulated by permits which are within those permit limitations shall not be a basis for enforcement proceedings under these basic standards:

(1) Except where authorized by permits, BMP's or plans of operation approved by the Division, state surface waters shall be free from substances attributable to human-caused point source or nonpoint source discharge in amounts, concentrations or combinations:

(a) which can settle to form bottom deposits detrimental to the beneficial uses. Depositions are stream bottom buildup of materials which include but are not limited to anaerobic sludges, mine slurry or tailings, silt, or mud; or
(b) which form floating debris, scum, or other surface materials sufficient to harm existing beneficial uses; or
(c) which produce color, odor, or other conditions in such a degree as to create a nuisance or harm existing beneficial uses or impart any undesirable taste to significant edible aquatic species or to the water; or
(d) which are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life; or
(e) which produce a predominance of undesirable aquatic life; or
(f) which cause a film on the surface or produce a deposit on shorelines."

2. <u>Specific Limitations</u>

The following limitations shall apply to all discharges covered by this permit:

a) Concrete wash water shall not be discharged to state waters or to storm sewer systems.

b) Bulk storage structures for petroleum products and other chemicals shall have adequate protection so as to contain all spills and prevent any spilled material from entering State waters.

c) No chemicals are to be added to the discharge unless permission for the use of a specific chemical is granted by the Division. In granting the use of such chemicals, special conditions and monitoring may be addressed by separate letter.

d) The Division reserves the right to require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent. Such monitoring may include Whole Effluent Toxicity testing.

e) All wastes composed of building materials must be removed from the site for disposal in licensed disposal facilities. No building material wastes or unused building materials shall be buried, dumped, or discharged at the site.

f) Off-site vehicle tracking of sediments shall be minimized.

g) All dischargers must comply with the lawful requirements of municipalities, counties, drainage districts and other local agencies regarding any discharges of stormwater to storm drain systems or other water courses under their jurisdiction, including applicable requirements in municipal stormwater management programs developed to comply with CDPS permits. Dischargers must comply with local stormwater management requirements, policies or guidelines including erosion and sediment control.

3. <u>Prohibition of Non-stormwater Discharges</u>

a) Except as provided in paragraph b, below, **all discharges covered by this permit shall be composed entirely of stormwater.** Discharges of material other than stormwater must be addressed in a separate CDPS permit issued for that discharge.

C. TERMS AND CONDITIONS (cont.)

b) Discharges from the following sources that are combined with stormwater discharges associated with construction activity may be authorized by this permit, provided that the non-stormwater component of the discharge is identified in the SWMP (see Part I.B.1.g of this permit):

- fire fighting activities
- springs
- landscape irrigation return flow

4. Releases in Excess of Reportable Quantities

This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous material must be handled in accordance with the Division's Notification Requirements (see Part II.A.3 of the permit).

5. Stormwater Management Plans

Prior to commencement of construction, the stormwater management plan (SWMP) shall be implemented for the construction site covered by this permit.

a) **Signatory Requirements:** The plan shall be signed in accordance with Part I.E.1., with one retained on site. The plan shall be made available to the Division, to local agencies or to EPA upon request.

b) **SWMP Review/Changes:** The permittee shall amend the plan whenever there is a significant change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity.

6. Inspections

a) **Active Sites** - For sites where construction has not been completed, the permittee shall make a thorough inspection of their stormwater management system at least every 14 days and after any precipitation or snowmelt event that causes surface erosion.

1) The construction site perimeter, disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWMP shall be observed to ensure that they are operating correctly.

2) Based on the results of the inspection, the description of potential pollutant sources, and the pollution prevention and control measures that are identified in the SWMP shall be revised and modified as appropriate as soon as practicable after such inspection. Modifications to control measures shall be implemented in a timely manner, but in no case more than 7 calendar days after the inspection.

3) The operator shall keep a record of inspections. Uncontrolled releases of mud or muddy water or measurable quantities of sediment found off the site shall be recorded with a brief explanation as to the measures taken to prevent future releases as well as any measure taken to clean up the sediment that has left the site. This record shall be made available to the Division upon request.

b) **Completed Sites** - For sites where all construction activities are completed but final stabilization has not been achieved due to a vegetative cover that has been planted but has not become established, the permittee shall make a thorough inspection of their stormwater management system at least once every month. When site conditions make this schedule impractical, permittees may petition the Division to grant an alternate inspection schedule. These inspections must be conducted in accordance with paragraphs 1), 2), and 3) of Part I.C.6.a. above.

C. TERMS AND CONDITIONS (cont.)

c) **Winter Conditions** - Inspections, as described above in a) and b), will not be required at sites where snow cover exists over the entire site for an extended period, and melting conditions do not exist. This exemption is applicable *only* during the period where melting conditions do not exist. Regular inspections, as described above, are required at all other times.

7. **Reporting**

No regular reporting requirements are included in this permit, however, the Division reserves the right to request that a copy of the inspection reports be submitted.

8. **SWMP Submittal Upon Request**

Upon request, the permittee shall submit a copy of the SWMP to the Division, and any local agency in charge of approving sediment and erosion plans, grading plans or stormwater management plans.

All SWMPs required under this permit are considered reports that shall be available to the public under Section 308(b) of the CWA. The owner or operator of a facility with stormwater discharges covered by this permit shall make plans available to members of the public upon request, unless the SWMP has been submitted to the Division. However, the permittee may claim any portion of a SWMP as confidential in accordance with 40 CFR part 2.

D. ADDITIONAL DEFINITIONS

For the purposes of this permit:

1. **BAT and BCT:** (Best Available Technology and Best Conventional Technology) Technology based federal water quality requirements covered under 40 CFR subchapter N.

2. **Best management practices (BMPs):** schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, waste disposal, or drainage from material storage.

3. **Dedicated asphalt plants and concrete plants:** portable asphalt plants and concrete plants that are located on or adjacent to a construction site and that provide materials only to that specific construction site.

4. **Final stabilization:** when all soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed. For purposes of this permit, establishment of a vegetative cover capable of providing erosion control equivalent to pre-existing conditions at the site will be considered final stabilization.

5. **Municipal storm sewer system:** a conveyance or system of conveyances (including: roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), owned or operated by a State, city, town, county, district, or other public body (created by state law), having jurisdiction over disposal of sewage, industrial waste, stormwater, or other wastes; designed or used for collecting or conveying stormwater.

6. **Operator:** the individual who has day to day supervision and control of activities occurring at the construction site. This can be the owner, the developer, the general contractor or the agent of one of these parties, in some circumstances. It is anticipated that at different phases of a construction project, different types of parties will satisfy the definition of 'operator' and that the permit will be transferred as the roles change.

7. **Outfall:** a point source at the point where stormwater leaves the construction site and discharges to a receiving water or a stormwater collection system.

D. ADDITIONAL DEFINITIONS (cont.)

8. **Part of a larger common plan of development or sale:** Part of a larger common plan of development or sale is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

9. **Point source:** any discernible, confined and discrete conveyance from which pollutants are or may be discharged. Point source discharges of stormwater result from structures which increase the imperviousness of the ground which acts to collect runoff, with runoff being conveyed along the resulting drainage or grading pattern.

10. **Process water:** any water which during manufacturing or processing, comes into contact with or results from the production of any raw material, intermediate product, finished product, by product or waste product. This definition includes mine drainage.

11. **Receiving waters:** any waters of the state of Colorado. These include any and all surface waters that are contained in or flow in or through the state of Colorado. This definition includes all water courses, even if they are usually dry.

12. **Runoff coefficient:** the fraction of total rainfall that will appear as runoff.

13. **Significant Materials:** includes but is not limited to: raw materials; fuels; materials such as metallic products; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharge.

14. **Stormwater:** precipitation-induced surface runoff.

15. **Waters of the state of Colorado:** any and all surface waters that are contained in or flow in or through the state of Colorado. This definition includes all water courses, even if they are usually dry.

E. GENERAL REQUIREMENTS

1. <u>Signatory Requirements</u>

a) All reports required for submittal shall be signed and certified for accuracy by the permittee in accordance with the following criteria:

1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
2) In the case of a partnership, by a general partner;
3) In the case of a sole proprietorship, by the proprietor;
4) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

b) **Changes to authorization.** If an authorization under paragraph a) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph a) of this section must be submitted to the Division, prior to or together with any reports, information, or applications to be signed by an authorized representative.

c) **Certification.** Any person signing a document under paragraph a) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather

E. GENERAL REQUIREMENTS (cont.)

and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. **Retention of Records**

a) The permittee shall retain copies of the SWMP and all reports required by this permit and records of all data used to complete the application to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized.

b) The permittee shall retain a copy of the SWMP required by this permit at the construction site from the date of project initiation to the date of final stabilization, unless another location, specified by the permittee, is approved by the Division.

PART II

A. MANAGEMENT REQUIREMENTS

1. **Change in Discharge**

The permittee shall inform the Division (Permits and Enforcement Section) in writing of any intent to construct, install, or alter any process, facility, or activity that is likely to result in a new or altered discharge, and shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge and receiving stream. The SWMP shall be updated within 30 days of the changes.

The permittee shall submit this notice to the Division within two weeks after making a determination to perform the type of activity referred to in the preceding paragraph.

Any discharge to the waters of the State from a point source other than specifically authorized by this permit is prohibited.

2. **Special Notifications - Definitions**

a) Spill: An unintentional release of solid or liquid material which may cause pollution of state waters.

b) Upset: An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

3. **Noncompliance Notification**

a) If, for any reason, the permittee does not comply with or will be unable to comply with any permit limitations, standards or permit requirements specified in this permit, the permittee shall, at a minimum, provide the Water Quality Control Division and EPA with the following information:

1) A description of the discharge and cause of noncompliance;

2) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and

A. MANAGEMENT REQUIREMENTS (cont.)

3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b) The permittee shall report the following instances of noncompliance orally within twenty-four (24) hours from the time the permittee becomes aware of the noncompliance, and shall mail to the Division a written report within five (5) days after becoming aware of the noncompliance (unless otherwise specified by the Division):

1) Any instance of noncompliance which may endanger health or the environment;

2) Any spill or discharge of oil or other substance which may cause pollution of the waters of the state.

c) The permittee shall report all other instances of non-compliance to the Division within 30 days. The reports shall contain the information listed in sub-paragraph (a) of this section.

4. Submission of Incorrect or Incomplete Information

Where the permittee failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or report to the Division, the permittee shall promptly submit the relevant application information which was not submitted or any additional information needed to correct any erroneous information previously submitted.

5. Bypass

The bypass of treatment facilities is generally prohibited.

6. Upsets

a) Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with permit limitations and requirements if the requirements of paragraph b of this section are met. (No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.)

b) Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

1) An upset occurred and that the permittee can identify the specific cause(s) of the upset;

2) The permitted facility was at the time being properly operated;

3) The permittee submitted notice of the upset as required in Part II.A.3. of this permit (24-hour notice); and

4) The permittee complied with any remedial measures required under Section 122.7(d) of the federal regulations.

c) Burden of Proof

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

A. MANAGEMENT REQUIREMENTS (cont.)

7. **Removed Substances**

Solids, sludges, or other pollutants removed in the course of treatment or control of wastewaters shall be properly disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State.

8. **Minimization of Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to waters of the State resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

9. **Reduction, Loss, or Failure of Treatment Facility**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the permit requirements. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, or all discharges, or both until the facility is restored or an alternative method of treatment is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

10. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

B. RESPONSIBILITIES

1. **Inspections and Right to Entry**

The permittee shall allow the Director of the State Water Quality Control Division, the EPA Regional Administrator, and/or their authorized representative, upon the presentation of credentials:

a) To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;

b) At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and

c) To enter upon the permittee's premises to investigate, within reason, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing permittee staff on alleged violations, and access to any and all facilities or areas within the permittee's premises that may have any effect on the discharge, permit, or alleged violation.

B. RESPONSIBILITIES (cont.)

2. **Duty to Provide Information**

The permittee shall furnish to the Division, within a reasonable time, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or inactivating coverage under this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

3. **Transfer of Ownership or Control**

Certification under this permit may be transferred to a new permittee if:

a) The current permittee notifies the Division in writing when the transfer is desired; and
b) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; and
c) The current permittee has met all fee requirements of the State Discharge Permit System Regulations, Section 6.16.0.

4. **Modification, Suspension, or Revocation of Permit By Division**

All permit modification, inactivation or revocation and reissuance actions shall be subject to the requirements of the State Discharge Permit System Regulations, Sections 6.6.2, 6.6.3, 6.8.0 and 6.16.0, 5 C.C.R. 1002-2, except for minor modifications.

a) This permit, and certification under this permit, may be modified, suspended, or revoked in whole or in part during its term for reasons determined by the Division including, but not limited to, the following:

1) Violation of any terms or conditions of the permit;

2) Obtaining a permit by misrepresentation or failing to disclose any fact which is material to the granting or denial of a permit or to the establishment of terms or conditions of the permit;

3) Materially false or inaccurate statements or information in the application for the permit;

4) Promulgation of toxic effluent standards or prohibitions (including any schedule of compliance specified in such effluent standard or prohibition) which are established under Section 307 of the Clean Water Act, where such a toxic pollutant is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit.

b) This permit, or certification under this permit, may be modified in whole or in part due to a change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge, such as:

1) Promulgation of Water Quality Standards applicable to waters affected by the permitted discharge; or

2) Effluent limitations or other requirements applicable pursuant to the State Act or federal requirements; or

3) Control regulations promulgated; or

4) Data submitted pursuant to Part I.B or Part I.C.2 indicates a potential for violation of adopted Water Quality Standards or stream classifications.

c) This permit, or certification under this permit, may be modified in whole or in part to include new effluent limitations and other appropriate conditions where data submitted pursuant to Part I.B.3 indicates that such

B. RESPONSIBILITIES (cont.)

effluent limitations and conditions are necessary to ensure compliance with applicable water quality standards and protection of classified uses.

d) At the request of the permittee, the Division may modify or inactivate certification under this permit if the following conditions are met:

1) In the case of inactivation, the permittee notifies the Division of its intent to inactivate the certification, and certifies that the site has been finally stabilized;

2) In the case of inactivation, the permittee has ceased any and all discharges to state waters and demonstrates to the Division there is no probability of further uncontrolled discharge(s) which may affect waters of the State.

3) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modification, amendment or inactivation;

4) Fee requirements of Section 6.16.0 of State Discharge Permit System Regulations have been met; and

5) Requirements of public notice have been met.

5. **Permit Violations**

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit.

Dischargers of stormwater associated with industrial activity, as defined in the EPA Stormwater Regulation (40 CFR 122.26(b)(14), which do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101. Failure to comply with CDPS permit requirements will also constitute a violation. Civil penalties for such violations may be up to $10,000 per day, and criminal pollution of state waters is punishable by fines of up to $25,000 per day.

6. **Legal Responsibilities**

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

7. **Severability**

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

B. RESPONSIBILITIES (cont.)

8. **Renewal Application**

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) days before this permit expires. If the permittee anticipates that there will be no discharge after the expiration date of this permit, the Division should be promptly notified so that it can inactivate the certification in accordance with Part II.B.4.d.

9. **Confidentiality**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Regulations for the State Discharge Permit System 6.6.4(2), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division. The permittee must state what is confidential at the time of submittal.

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Commission or the Division, but shall be kept confidential. Any person seeking to invoke the protection of this section shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

10. **Fees**

The permittee is required to submit payment of an annual fee as set forth in the Water Quality Control Act. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S. 1973 as amended.

11. **Requiring an Individual CDPS Permit**

The Director may require any owner or operator covered under this permit to apply for and obtain an individual CDPS permit if:

a) The discharger is not in compliance with the conditions of this general permit;

b) Conditions or standards have changed so that the discharge no longer qualifies for a general permit; or

c) Data become available which indicate water quality standards may be violated.

The owner or operator must be notified in writing that an application for an individual CDPS permit is required. When an individual CDPS permit is issued to an owner or operator otherwise covered under this General Permit, the applicability of the general permit to that owner or operator is automatically inactivated upon the effective date of the individual CDPS permit.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
Water Quality Control Division
WQCD-PE-B2
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

RATIONALE

STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL PERMIT IN COLORADO

COLORADO DISCHARGE PERMIT NUMBER COR-030000

CONTENTS *PAGE*

I.	*Introduction*	*1*
II.	*Background*	*1*
III.	*Stormwater Discharges Associated with Construction Activity*	*2*
IV.	*Coverage Under this Permit*	*4*
V.	*Application and Certification*	*4*
VI.	*Terms and Conditions of Permit*	*4*
VII.	*Changes Made After Public Notice*	*6*

I. INTRODUCTION

This permit is for the regulation of stormwater runoff from construction activities. The term "construction activity" includes clearing, grading and excavation operations. "Stormwater" is precipitation-induced surface runoff. This Rationale will explain the background of the Stormwater program, activities which are covered under this permit, how to apply for coverage under this permit, and the requirements of this permit.

A. Changes in this General Permit

Several notable changes from the previous General Permit for Construction Activities have been incorporated into this permit. These changes are listed below:

1. *Only original signatures on completed application forms will be accepted for processing. Faxed applications will not be accepted.*

2. *No annual report is required under this permit. This requirement has been eliminated from the previous permit.*

3. *The frequency of required inspections of the stormwater management system will vary under this permit relative to conditions at the site. Alternate frequencies are in place for completed sites and sites where winter conditions exist. Refer to Part I.C.6 of the permit for more details.*

4. *The description of what constitutes final stabilization at a site has been expanded to include a narrative description, in addition to the numeric standard. Refer to Part I.B.4 of the permit for more details.*

II. BACKGROUND

As required under the Clean Water Act amendments of 1987, the Environmental Protection Agency (EPA) has established a framework for regulating municipal and industrial stormwater discharges. This framework is under the National Pollutant Discharge Elimination System (NPDES) program (Note: The Colorado program is referred to as the Colorado Discharge Permit System, or CDPS, instead of NPDES). The Water Quality Control Division ("the Division") has stormwater regulations (5CCR 1002-2, 6.1.0) in place. These regulations require specific types of industrial facilities that discharge stormwater associated with industrial activity (industrial stormwater), to obtain a CDPS permit for such

II. BACKGROUND (cont.)

discharge. The regulations specifically include construction activities that disturb five acres of land or more as industrial facilities. Smaller construction activities which are part of a larger common plan of development which disturb five acres or more over a period of time are also included. (Certification under this permit is not limited to construction sites which disturb more than five acres.)

A. General Permits

The regulations allow states which have been delegated the NPDES program to issue general permits or individual permits to regulate industrial stormwater discharges. The State of Colorado is a delegated state, and has the authority to issue general permits under the Colorado Water Quality Control Act.

The Water Quality Control Division ("the Division") has determined that the use of general permits is the appropriate procedure for handling the thousands of industrial stormwater applications within the State.

B. Permit Requirements

This permit does not require submission of effluent monitoring data in the permit application or in the permit itself. It is believed that fully implemented Stormwater Management Plans (SWMPs) are sufficient to control water quality impacts.

The narrative permit requirements include prohibitions against discharges of non-stormwater (e.g. process water). They require dischargers to control and eliminate the sources of pollutants in stormwater through the development and implementation of a SWMP. The plan must include Best Management Practices (BMPs), which will include pollution prevention and source reduction measures. This will constitute BAT and BCT and should achieve compliance with water quality standards. Refer to Part I.D.1 of the permit.

In addition, as a condition of this permit, the permittee is required to pay the annual fee as described in the Water Quality Control Act. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action as discussed below. Permittees will be billed for the initial permit fee within a few months of permit issuance.

C. Violations/Penalties

Dischargers of stormwater associated with industrial activity, as defined in the Regulations for the State Discharge Permit System (6.1.0), which do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the Federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101. For facilities covered under a CDPS permit, failure to comply with any CDPS permit requirement constitutes a violation. Civil penalties for violations of the Act or CDPS permit requirements may be up to $10,000 per day. Criminal pollution of state waters is punishable by fines of up to $25,000 per day.

III. STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

The Stormwater regulations require that stormwater discharges associated with certain industrial activities be covered under the permit program. Construction activity that disturbs five acres or more is specifically included in the listed industrial activities.

A. Construction Activity

Construction activity includes clearing, grading and excavation activities. Construction does not include routine maintenance performed by public agencies, or their agents to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Definitions of additional terms can be found in Part I.D of the Permit.

III. STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (cont.)

The Division's regulations specify that for the purposes of stormwater discharge permits, construction activity includes clearing, grading and excavation activities except: operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale. A larger common plan of development or sale is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

The federal exemption for construction activities that disturb less than five acres has been challenged in federal court, and vacated in a 9th Circuit Court of Appeals decision (1992 WL 117156 (9th Cir.(Cal.)). The Division's regulations contain this exemption for sites disturbing less than five acres based on separate justification. However, construction activities which disturb less than five acres but still wishing to obtain coverage under this permit as a precaution may do so.

B. Types of Activities Covered

This permit is intended to cover most new or existing discharges composed entirely of stormwater from construction activities that are required by State regulation to obtain a permit. This includes stormwater discharges associated areas that are dedicated to producing earthen materials, such as soils, sand and gravel, for use at a single construction site. These areas may be located at the construction site or at some other location. This permit does not authorize the discharge of mine water or process water from such areas.

This permit also includes stormwater discharges associated with dedicated asphalt plants and concrete plants located at the construction sites.

C. Types of Activities NOT Covered

This permit does not cover stormwater discharged from construction sites that is mixed with stormwater from other types of industrial activities, or process water of any kind. Other types of industrial activities that require stormwater discharge permits pursuant to different sections of the regulations [5 CCR 1002-2 Section 6.4.2(5)(b)(I-ii,iv-xi)], are not covered by this permit.

This permit also does not cover the discharge of process water. If the construction activity encounters groundwater, a Construction Dewatering Discharge Permit (Permit Number COG-070000) must also be obtained in order to discharge this groundwater from the excavation site. An application for this permit can be obtained from the Division at the address listed in Part I, section A.3 of the Permit.

D. Exemptions for Small Municipalities

The Intermodal Surface Transportation Efficiency Act of 1991 (Section 1068(c)) added an exemption to the stormwater regulations for municipalities with less than 100,000 population. The term "municipality" includes cities, towns, counties, special districts or any entity created by or pursuant to State law.

Stormwater discharges associated with industrial activity (except for airports, steam electric power plants, or uncontrolled sanitary landfills), that are owned or operated by a small municipality are not required to apply for or obtain a stormwater permit at this time. (Note: This exemption does not apply to other, privately owned construction sites within the same small municipality.)

These facilities are not permanently exempted from the regulation, but are instead placed in Phase II of the stormwater program. The Division and EPA are not pursuing permits for Phase II facilities, including small municipalities, until further rulemaking is completed. It is possible that coverage will be required at some future date.

IV. COVERAGE UNDER THIS GENERAL PERMIT

Under this general permit, operators of stormwater discharges associated with construction activity may be granted authorization to discharge stormwater into waters of the State of Colorado. This includes stormwater discharges associated with industrial activity from areas that are dedicated to producing earthen materials, such as soils, sand and gravel, for use at a single construction site and dedicated asphalt plants and dedicated concrete plants.

This permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.

Authorization to discharge under the permit requires submittal of a completed application form and a certification that the SWMP is complete. Upon receipt of all required information, the Division may allow or disallow coverage under the general permit.

V. APPLICATION AND CERTIFICATION

At least ten days prior to the anticipated date of discharge, the operator of the construction site shall submit an original completed application which includes the signed certification that the SWMP is complete. In order to avoid confusion during processing, original signatures are required for the application to be considered complete.

For the purpose of this permit, the "operator" is the person who has day-to-day control over the project. This can be the owner, the developer, the general contractor or the agent of one of these parties, in some circumstances. At different times of a construction project, different types of parties may satisfy the definition of 'operator' and the certification may be transferred as roles change.

(Note - Under the Federal regulations, this application process is referred to as a Notice of Intent, or NOI. For internal consistency with its current program, the Division will continue to use the term "application.") An outline of the permit application requirements is found in the permit at Part I.A.3.b.

If this general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

VI. TERMS AND CONDITIONS OF PERMIT

A. Stormwater Management Plans (SWMPs)

Prior to commencement of construction, a stormwater management plan (SWMP) shall be developed and implemented for each facility covered by this permit. A certification that the SWMP is complete must be submitted with the permit application. The SWMP shall identify potential sources of pollution (including sediment) which may reasonably be expected to affect the quality of storm water discharges associated with construction activity from the facility. In addition, the plan shall describe the best management practice (BMPs) which will be used to reduce the pollutants in stormwater discharges from the construction site. Facilities must implement the provisions of their SWMP as a condition of this permit. The SWMP shall include the following items:

1. *Site Description*
2. *Site Map*
3. *BMPs for Stormwater Pollution Prevention*
4. *Longterm Stormwater Management*
5. *Other Controls*

VI. TERMS AND CONDITIONS OF PERMIT (cont.)

6. Inspection and Maintenance

7. Signatory Requirements and Availability

8. SWMP Review/Changes

(See Part I.B. of the permit for a more detailed description of SWMP requirements.)

B. Monitoring

Sampling and testing of stormwater for specific parameters is not required on a routine basis under this permit. However, the Division reserves the right to require sampling and testing on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent.

C. Submittal Upon Request

If requested, the permittee shall submit the SWMP to the Division, to EPA, or to the local agency approving sediment and erosion control plans, grading plans or stormwater management plans. In the case of a stormwater discharge associated with construction activity which discharges through a municipal separate storm sewer system, the permittee shall submit the SWMP to the municipal operator of the system upon request.

The permit includes a paragraph that clarifies that SWMPs are available to the public, and that the permittee must make plans available to members of the public upon request, if a plan had not been previously submitted to the Division.

D. Facility Inspections

The frequency at which site inspections must occur now varies according to conditions at the site. Active construction sites must inspect their stormwater management controls at least every 14 days and after any precipitation or snowmelt event that causes surface erosion. At sites where construction has been completed but a vegetative cover has not been established, these inspections must occur at least once per month. At sites where winter conditions exist, inspections are not required during the period that the winter conditions exist. For all of these inspections, records must be kept on file. Refer to the permit at Part I.C.6 for detailed requirements of these inspections.

This change was made in the inspection frequency to address comments made to the Division at public meetings held to discuss this permit renewal. The intent is to provide a more practical inspection schedule for sites where certain atypical conditions exist, and the potential for erosion is minimal.

E. Revision of SWMP

Based on the results of the inspections (see D. above), the description of potential pollutant sources and the pollution prevention and control measures, identified in the SWMP, and the control measures themselves, shall be revised and modified as appropriate as soon as practicable after such inspection. Modification of control measures shall be implemented in a timely manner, but in no case more than 7 calendar days after the inspection.

F. Reporting

The inspection record shall be made available to the Division upon request. Regular submittal of an annual report is not required in this permit. The Division discovered through the administration of the original permit, that the benefit derived from submittal of annual reports was not worth the administrative effort for both the permittee and the Division.

VI. TERMS AND CONDITIONS OF PERMIT (cont.)

G. Inactivation Notice

When a site has been finally stabilized in accordance with the SWMP, the operator of the facility shall submit a Inactivation Notice that is signed in accordance with Part I.E.1. of the permit. The content of the Inactivation Notice is described in Part I.A.5. of the permit. A copy of the Inactivation Notice form will be mailed to the permittee along with the permit certification. Additional copies are available from the Division.

The description of "final stabilization" at Part I.B.4 of the permit has been expanded to include a narrative description, as well as a numeric criterion. This should provide permittees with more flexibility in inactivating their certification.

H. Transfer of Permit

When responsibility for stormwater discharges at a construction site changes from one individual to another, the permit shall be transferred in accordance with Part I.A.6. of the permit. The content of the Notice of Transfer and Acceptance of Terms of a Construction General Stormwater Discharge Permit is described at Part I.A.6. of the permit. The Notice of Transfer form will be mailed to the permittee along with the permit certification. Additional copies are available from the Division.

I. Duration of Permit

The general permit will expire on June 30, 2002. The permittee's authority to discharge under this permit is approved until the expiration date of the general permit. Many permittees will have filed an Inactivation Notice (see section G. above) by that time and will not be affected by permit expiration. Any permittee desiring continued coverage under the general permit must apply for recertification under the general permit at least 90 days prior to its expiration date.

Daniel Beley
February 19, 1997

VII. CHANGES MADE AFTER PUBLIC NOTICE

The Division received four comment letters during the 30 day public comment period. The following changes were made to the permit based on these comments.

A. The narrative description of final stabilization at Part I.B.4 of the permit was changed to clarify that the permittee has a choice in describing how final stabilization is acheived. The intent of the permit is to allow the permittee to use either the numeric standard, or the narrative standard in achieving final stabilization. Both methods are described in this portion of the permit.

B. For construction sites where retaining a copy of the SWMP on site is not practical, language at Part I.E.2.b was added to the permit to allow a permittee to petition the Division to approve an alternate location to keep a copy of the SWMP.

C. For completed sites where conducting monthly inspections is not practical, language was added at Part I.C.6.b to allow the permittee to petition the Division to allow an alternate inspection schedule to be implemented.

Several other minor changes were suggested in the comment letters that were not included in the permit.

Daniel Beley
May 6, 1997

STATE OF COLORADO
GENERAL PERMIT APPLICATION

STORMWATER
DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

This application is for use by all stormwater dischargers engaged in construction activities. Construction activities include clearing, grading, excavation, and other ground disturbance activities. Construction does not include routine maintenance performed by public agencies, or their agents to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Application Due Dates: At least **ten days** prior to the anticipated date of discharge (start of construction), the owner or operator of the construction activity shall submit an application as provided by the Water Quality Control Division (the "Division"). This form may be reproduced.

Permit Fee: Do not send any payment with this application. You will be billed once you are covered under a permit.

Application Completeness: All items of the application must be completed accurately and in their entirety or the application will be deemed incomplete, and processing of the permit will not begin until all information is received. Each application shall be submitted by certified mail or hand delivered, only to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-PE-B2
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530
Attention: Permits and Enforcement Section

If you have questions on completing this application, you may contact the Section at (303) 692-3590.

INSTRUCTIONS

Item 1 - Provide the name and address of the permit applicant, including the company name, local contact, and mailing address. Indicate whether the applicant is the owner, developer or contractor of the construction site, and the status as a private, federal, state, county or other public entity. Include the applicant Federal taxpayer identification number (nine digits). Public entities should use their Federal employer identification number. This number will be used as an identifier for billing purposes.

Item 2 - Provide the street address of the construction site. For the approximate center point of the property, **both** types of descriptions (legal, in terms of Township, Range and ¼ section, **and** longitude/latitude, to the nearest 15 seconds) **must** be included. This information is easily obtainable from a U.S. Geological Survey topographical map, available at area map stores. Also include the name of the construction project.

Item 3 - Briefly describe the nature of the construction activities. Include such things as what is being constructed, the ultimate land use, construction methods, or other factors which might affect stormwater quality.

Item 4 - Provide the current estimated start and completion dates for the construction project.

Item 5 - Provide the total area of the construction site and the area that will undergo disturbance, in acres. **Note:** aside from clearing, grading and excavation activities, disturbed areas also include areas receiving overburden, and areas with heavy equipment/vehicle traffic.

Item 6 - Identify the receiving water. Receiving waters are any waters of the state of Colorado. These include any and all surface waters that are contained in or flow in or through the state of Colorado (except for water withdrawn for use until use and treatment have been completed). This definition includes all water courses, even if they are usually dry.

If stormwater from the construction site enters a ditch or storm sewer system, identify that system and indicate the ultimate receiving water for the ditch or storm sewer. **Note:** a stormwater discharge permit does **not** allow a discharge into a ditch or municipal storm sewer system without the approval of the owner/operator of that system.

Item 7 - Indicate any other environmental permits, such as city or county grading or erosion control permits or dredge and fill (COE 404) permits, that are held for this construction site. Include the permit number.

If you currently have a discharge permit from the Division for the discharge of process water (such as construction dewatering), include the number here.

If this item does not apply to you, enter "Not Applicable" to show that you considered the question.

Item 8 - The certification of completion of a Stormwater Management Plan (SWMP) **must** be signed by the applicant or their authorized agent. Appendix A contains the requirements for the SWMP **during the period of construction** (as listed in the general permit). Submittal of the SWMP is **not** required, however it must be developed and implemented and kept at the construction site. The Division reserves the right to request the SWMP at any time.

Item 9 - The application **must be signed** to be considered complete. <u>In all cases</u>, it shall be signed as follows:

a) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the over-all operation of the facility from which the discharge described in the application originates.

b) In the case of a partnership, by a general partner.

c) In the case of a sole proprietorship, by the proprietor.

d) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

STATE OF COLORADO
GENERAL PERMIT APPLICATION

STORMWATER
DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

This application is for use by all stormwater dischargers engaged in construction activities. Construction activities include clearing, grading, excavation, and other ground disturbance activities. Construction does not include routine maintenance performed by public agencies, or their agents to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Application Due Dates: At least **ten days** prior to the anticipated date of discharge (start of construction), the owner or operator of the construction activity shall submit an application as provided by the Water Quality Control Division (the "Division"). This form may be reproduced.

Permit Fee: Do not send any payment with this application. You will be billed once you are covered under a permit.

Application Completeness: All items of the application must be completed accurately and in their entirety or the application will be deemed incomplete, and processing of the permit will not begin until all information is received. Each application shall be submitted by certified mail or hand delivered, only to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-PE-B2
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530
Attention: Permits and Enforcement Section

If you have questions on completing this application, you may contact the Section at (303) 692-3590.

INSTRUCTIONS

Item 1 - Provide the name and address of the permit applicant, including the company name, local contact, and mailing address. Indicate whether the applicant is the owner, developer or contractor of the construction site, and the status as a private, federal, state, county or other public entity. Include the applicant Federal taxpayer identification number (nine digits). Public entities should use their Federal employer identification number. This number will be used as an identifier for billing purposes.

Item 2 - Provide the street address of the construction site. For the approximate center point of the property, **both** types of descriptions (legal, in terms of Township, Range and ¼ section, **and** longitude/latitude, to the nearest 15 seconds) **must** be included. This information is easily obtainable from a U.S. Geological Survey topographical map, available at area map stores. Also include the name of the construction project.

Item 3 - Briefly describe the nature of the construction activities. Include such things as what is being constructed, the ultimate land use, construction methods, or other factors which might affect stormwater quality.

GENERAL PERMIT APPLICATION

STORMWATER DISCHARGES
ASSOCIATED WITH:

CONSTRUCTION ACTIVITY

(Permit No. COR-030000)

FOR AGENCY USE ONLY									
Certification Number									
C	O	R	-	0	3				
Date Received									
Year			Month			Day			

Please print or type. All items must be completed accurately and in their entirety or the application will be deemed incomplete and processing of the permit will not begin until all information is received. Please refer to the instructions for information about the required items. An original signature of the applicant is **required.**

1. **Name and address of the permit applicant**:

Company Name _____

Mailing Address _____

City, State and Zip Code _____

Phone Number (____) _____ Who is applying? Owner ☐ Developer ☐ Contractor ☐

Federal Taxpayer (or Employer) ID#: __ __ __ __ __ __ __ __ __

Entity Type: Private ☐ Federal ☐ State ☐ County ☐ City ☐ Other: _____

Local Contact (familiar with facility) _____

Title _____ Phone Number _____

2. **Location of the construction site:**

Street Address _____

City, State and Zip Code _____

County _____ Name of plan or development _____

Legal Location (Township, Range, section, 1/4 section): _____

Latitude and Longitude _____

3. **Briefly describe the nature of the construction activity**:

_____

_____

_____

_____

_____

4. **Anticipated construction schedule**:

Commencement date: _____ Completion date: _____

5. **Area of the construction site**: Total area (acres) _____

Area to undergo disturbance (acres) _____

6. **The name of the receiving stream(s). (If discharge is to a ditch or storm sewer, also include the name of the ultimate receiving water)**: _____

_____

7. **Other environmental permits held for this construction activity (include permit number)**:

_____

_____

_____

8. **Stormwater Management Plan Certification**:

"I certify under penalty of law that a complete Stormwater Management Plan, as described in Appendix A of this application, has been prepared for my facility. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the Stormwater Management Plan is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for falsely certifying the completion of said SWMP, including the possibility of fine and imprisonment for knowing violations."

_____

Signature of Applicant Date Signed

_____

Name (printed) Title

9. **Signature of Applicant (legally responsible person)**

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment."

_____

Signature of Applicant Date Signed

_____

Name (printed) Title

Colorado Department of Public Health & Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

For Agency Use Only

Rec ____ ____ ____

Eff ____ ____ ____
Year Mo Day

INACTIVATION NOTICE FOR

CONSTRUCTION STORMWATER DISCHARGE GENERAL PERMIT CERTIFICATION

Please print or type. Form must be filled out completely.

Certification Number: **COR-03** ___ ___ ___ ___ Taxpayer ID or EIN ___ ___ ___ ___ ___ ___ ___ ___ ___

Permittee (Company) Name: _____

Permittee Address: _____

_____

_____ Phone No. ( ) _____

Site/Facility Name: _____

Construction Site Address/Location: _____

_____

County: _____ Contact Person: _____

Summary of work performed and **description of final site stabilization**: _____

_____

_____

_____

I certify under penalty of law that by the date of my signature below, all disturbed soils at the identified construction site have been finally stabilized; all temporary erosion and sediment control measures have been removed; all construction and equipment maintenance wastes have been disposed of properly; and all elements of the Stormwater Management Plan have been completed.

I understand that by submitting this notice of inactivation, I am no longer authorized to discharge stormwater associated with construction activity by the general permit. I understand that discharging pollutants in stormwater associated with construction activities to the waters of the State of Colorado, where such discharges are not authorized by a CDPS permit, is unlawful under the Colorado Water Quality Control Act and the Clean Water Act.

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (See 18 U.S.C 1001 and 33 U.S.C. 1319.)

_____

Signature of Permit Applicant (Legally Responsible Party) Date Signed

_____

Name (printed) Title

5/98/cn/in

APPENDIX A

CONTENTS OF THE STORMWATER MANAGEMENT PLAN (SWMP)

The SWMP shall be prepared in accordance with good engineering, hydrologic and pollution control practices. (The SWMP need not be prepared by a registered engineer.) The main objective of the plan is to identify Best Management Practices (BMPs) which when implemented will meet the terms and conditions of the general permit. Note: The Division has a guidance document available on construction SWMP preparation (call 303-692-3590).

The plan shall identify potential sources of pollution (including sediment) which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the facility. In addition, the plan shall describe and ensure the implementation of BMPs which will be used to reduce the pollutants in stormwater discharges associated with construction activity. **The BMPs must be implemented before construction/grading begins.** Construction operations must implement the provisions of the SWMP required under this part as a condition of this permit.

The SWMP shall include the following items, at a minimum:

1. **Site Description**

   Each plan shall provide a description of the following:
   a) A description of the construction activity.
   b) The proposed sequence for major activities.
   c) Estimates of the total area of the site, and the area of the site that is expected to undergo clearing, excavation or grading.
   d) An estimate of the runoff coefficient of the site before and after construction activities are completed and any existing data describing the soil, soil erosion potential or the quality of any discharge from the site.
   e) A description of the existing vegetation at the site and an estimate of the percent vegetative ground cover.
   f) The location and description of any other potential pollution sources, such as vehicle fueling, storage of fertilizers or chemicals, etc.
   g) The location and description of any anticipated non-stormwater components of the discharge, such as springs and landscape irrigation return flow.
   h) The name of the receiving water(s) and the size, type and location of any outfall or, if the discharge is to a municipal separate storm sewer, the name of that system, the location of the storm sewer discharge, and the ultimate receiving water(s).

2. **Site Map**

   Each plan shall provide a generalized site map or maps which indicate:
   - construction site boundaries
   - all areas of soil disturbance
   - areas of cut and fill
   - areas used for storage of building materials, soils or wastes
   - location of any dedicated asphalt or concrete batch plants
   - location of major erosion control facilities or structures
   - springs, streams, wetlands and other surface waters
   - boundaries of 100-year flood plains, if determined

3. **BMPs for Stormwater Pollution Prevention**

   The plan shall include a narrative description of appropriate controls and measures that will be implemented before and during construction activities at the facility.

The plan shall clearly describe the relationship between the phases of construction and the implementation and maintenance of controls and measures. For example, which controls will be implemented during each of the following stages of construction: clearing and grubbing necessary for perimeter controls, initiation of perimeter controls, remaining clearing and grubbing, road grading, storm drain installation, final grading, stabilization, and removal of control measures.

The description of controls shall address the following minimum components:

a) Erosion and Sediment Controls

1) **Structural Practices.** A description of structural site management practices which will minimize erosion and sediment transport. Such practices may include: straw bales, silt fences, earth dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, and temporary or permanent sediment basins.

2) **Non-Structural Practices.** A description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where possible and that disturbed areas are stabilized. Non-structural practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, and preservation of mature vegetation.

b) Materials Handling and Spill Prevention

The SWMP shall identify any procedures or significant materials handled at the site that could contribute pollutants to runoff. These could include: exposed storage of building materials, fertilizers or chemicals; waste piles; and equipment maintenance or fueling procedures. Areas or procedures where potential spills can occur shall have spill prevention and response procedures identified.

Measures to control stormwater pollution from dedicated concrete batch plants or dedicated asphalt batch plants covered by this certification, must be identified in the SWMP.

4. **Final Stabilization and Longterm Stormwater Management**

A description of the measures used to achieve final stabilization and measures to control pollutants in stormwater discharges that will occur **after** construction operations have been completed.

Final stabilization is reached when all soil disturbing activities at the site have been completed, and uniform vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels or equivalent permanent, physical erosion reduction methods has been employed. The Division may, after consultation with the permittee and upon good cause, amend the final stabilization criteria for specific operations.

5. **Other Controls**

A description of other measures to control pollutants in stormwater discharges, including plans for waste disposal and limiting off site soil tracking.

6. **Inspection and Maintenance**

A description of procedures to inspect and maintain in good and effective operating condition the vegetation, erosion and sediment control measures and other protective measures identified in the SWMP.

SECTION 01900

CONSTRUCTION PHASING AND SCHEDULE RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY
This Section summarizes required phasing and schedule restrictions applicable to the Work. Other than as specified herein, the construction sequence shall be determined by the Contractor who shall schedule and sequence his operations to ensure the least inconvenience to the general public and to adjacent property owners and tenants.

1.1.1 Partial Occupancy
Construction of the project will largely take place in public parking and access areas, and within public street and highway rights-of-way. It is the intent of these specifications that Contractor's use of such areas be limited in time to the maximum practicable extent, and that they be returned to public use at the earliest practicable date(s). The Government reserves the right to occupy and to return to public use those parts of the construction and access easements on which construction has been completed in accordance with the phasing plan immediately upon completion of all necessary surface restoration, provided such occupancy does not interfere with completion of the work. Such partial occupancy shall not constitute acceptance of the total work.

1.1.2 Contractor's Use of Premises
The Government has obtained the permanent and temporary construction and access easements indicated on the drawings. During the construction period, Contractor shall have full use of the indicated easements, other than as specified herein.

1.1.3 Vehicular and Pedestrian Access
The Contractor shall maintain vehicular and pedestrian access to all businesses impacted by construction at all times.

1.1.4 Weekly Summary of Construction Activity and Schedule
The Contractor shall submit a weekly summary of construction activities that will impact local businesses. The summary shall note scheduled start and finish dates of construction activities. This concise summary shall be typed and submitted at the weekly coordination meetings. The intent of this provision is to enable the City of Arvada to keep local businesses informed at all times of the contractor's construction activities and schedule.

1.1.5 Parking
Contractor employees, subcontractors, suppliers, etc., shall only be permitted to park within construction and easement areas shown on the drawings. Contractor employees, subcontractors, suppliers, etc., shall not be permitted to park on private property or in adjacent parking lots at any time.

1.1.6 Construction Access
Contractor employees, subcontractors, suppliers, etc., shall use only designated access routes to construction areas. Construction areas shall not be accessed by driving through active parking lots.

1.2 CONSTRUCTION PHASING
The Contractor shall construct the project in accordance with sequential phasing shown on the contract drawings. Public use areas occupied by construction and access easements shall be returned to full public use at the earliest practicable date. The Contractor shall not begin work in a new phase until all work, including bituminous pavement and pavement markings, have been completed in the preceding phase. Upon completion of surface restoration to include bituminous

pavement and all pavement markings associated with each phase, the restored area shall be returned to public use, and the Contractor shall have no further right to enter upon the restored area other than as may be required to correct defective work. The Contractor shall provide written notification to the Corps of Engineers-Resident Office, at least three weeks prior to closing any road for construction work. Construction of downstream segment Phases 1 through 5 must proceed sequentially starting with Phase 1. Each downstream phase shall be completed before the next sequential phase is started unless otherwise approved in writing by the Contracting Officer (reference paragraph 1.2.6 regarding Phase 6 requirements). Construction of the upstream segment phases (Phases 1 and 2) must proceed sequentially starting with Phase 1. Construction of upstream and downstream segments can be done concurrently. The following special notes and restrictions are applicable to various phases of the work.

1.2.1 Phase 1 Construction-Downstream Segment
Construction access for Phase 1 construction shall be from Garrison Street along the access route indicated. Contractor's use of that access easement shall terminate upon completion of the indicated Phase 1 restoration. Under no circumstance will Phase 1 and Phase 2 construction be permitted to proceed concurrently. The Contractor shall not begin any Phase 2 construction until all Phase 1 construction is complete, including bituminous pavement and pavement markings.

1.2.2 Phase 2 Construction-Downstream Segment
Construction access for Phase 2 shall be from West 58th Ave. via the access easement indicated. Contractor will not have exclusive use of the access easement during the construction period. The Contractor shall cooperate with adjacent properties and the general public to permit generally unimpeded public use of the access easement. Under no circumstance will Phase 2 and Phase 1 construction be permitted to proceed concurrently. The Contractor shall not begin any Phase 2 construction until all Phase 1 construction has been completed, including bituminous pavement and pavement markings.

1.2.3 Phase 3 Construction-Downstream Segment
Construction access for Phase 3 shall be as specified above for Phase 2. The Contractor may utilize Independence Street/Ralston Road for Phase 3 access, but shall not block or otherwise interfere with existing points of access to adjacent properties. Phase 3 construction, once begun, shall be carried forward as expeditiously as practicable so as to minimize the period of time that Independence/Ralston Road is unavailable for public use. Contractor's right of use of the access easement from West 58th Avenue east of Independence Street shall cease upon completion of the indicated restoration for Phases 2 and 3. The Contractor shall not begin any Phase 3 construction until all Phase 2 construction has been completed, including bituminous pavement and pavement markings.

1.2.4 Phase 4 Construction-Downstream Segment
Construction access for Phase 4 shall be from southbound Independence via the temporary construction access easement indicated. The Contractor shall not have exclusive use of the access easement during the construction period; and shall cooperate with adjacent properties and the general public to permit generally unimpeded public use of the access easement. The Contractor shall not begin any Phase 4 construction until all Phase 3 construction has been completed, including bituminous pavement and pavement markings. The Contractor shall adjust barricades and fencing to allow one-way traffic from southbound Independence Street westbound into the shopping center.

1.2.5 Phase 5 Construction-Downstream Segment
Construction access for Phase 5 shall be along the existing right-of-way for West 58th Avenue. Other than as indicated, the Contractor shall not interfere with existing points of access to adjacent properties. The Contractor shall not begin

any Phase 5 construction until all Phase 4 construction has been completed, including bituminous pavement and pavement markings.

1.2.5.1 Temporary Bypass (Shoofly) for West 58th Ave.
Construction of the temporary bypass for West 58th Avenue may proceed at any time following issuance of the Notice to Proceed, without limitation due to concurrent construction of other phases of the work. However, West 58th Avenue shall remain open to traffic and the Bypass shall not be used until such time as it is necessary to close West 58th Avenue to initiate structure excavation. The Contractor shall provide and maintain access to all local businesses along West 58th Avenue at all times during construction and operation of the shoofly.

1.2.6 Phase 6 Construction-Downstream Segment
Phase 6 construction may proceed at any time subsequent to issuance of the Notice to Proceed, other than as it may conflict with construction and use of the West 58th Bypass.

1.2.7 Phase 1 Construction-Upstream Segment
Phase 1 restrictions are noted on the upstream segment contract drawings.

1.2.8 Phase 2 Construction-Upstream Segment
Phase 2 restrictions are noted on the upstream segment contract drawings.

1.3 SCHEDULE RESTRICTIONS
All areas within the limits of Upstream Segment Phases 1 through 4, and 5 (between stations 44+00 and 65+00) shall be available for full public use during the period beginning November 10 and extending through December 31, of any calendar year. The Contractor shall so schedule and conduct his operations such that those areas are either fully restored or unaffected by construction during such periods.

1.4 CONSTRUCTION PROGRESSION
The Contracting Officer shall have sole authority to decide when a current construction phase is complete, when subsequent construction phases may commence, and when various traffic control features of current and subsequent phases are to be operational.

The Contracting Officer will also have sole authority on deciding when the Contractor fulfilled all requirements for completion of a current phase before allowing the Contractor to commence with subsequent phases.

1.5 UTILITY RELOCATIONS
Relocation of existing utilities which interfere with the proposed construction will be performed by others as shown on utility relocation sheets (U sheets) on the upstream and downstream drawings. The following summarizes the general nature of utility relocations by others, as shown on the drawings.

Utility	Owner
Electric (UG & OH)	Xcel Energy, Private Owners
Gas	Xcel Energy
Water	City of Arvada
Telephone	QWest
Fiber Optic	Qwest
Sanitary Sewer	City of Arvada
Gauging Station	City of Arvada
Fire Hydrant	City of Arvada
Storm Drainage	City of Arvada

1.6 Work Performance/Clean-Up

The Contractor shall conduct all work in an orderly manner to minimize disturbance and inconvenience to business properties adjacent to delineated construction boundaries. The Contractor shall be responsible for continuous clean-up of debris and material that migrates off the construction site. Clean-up shall include soil deposited or tracked by construction equipment outside construction boundaries.

PART 2 NOT USED

PART 3 NOT USED

SECTION 02050

DEMOLITION

09/91

PART 1 GENERAL

1.1 REFERENCES

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

ENGINEERING MANUALS (EM)

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

1.2 GENERAL REQUIREMENTS

The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, the work shall be performed in accordance with \-EM 385-1-1-\, Section 23, Demolition, and other applicable Sections. In the interest of conservation, salvage shall be pursued to the maximum extent possible; salvaged items and materials shall be disposed of as specified.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Plan; G-AO.

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services. Planned methods and procedures for protection and support of fiber-optic communication lines shall be included. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations in accordance with \-EM 385-1-1-\.

SD-09 Manufacturer’s Field Reports

Disposal Facilities; G-AO

Location of disposal facilities and appropriate documentation showing each disposal facility is licensed to accept the type of material to be disposed.

1.4 DUST CONTROL

The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

1.5 PROTECTION

1.5.1 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, may be allowed to remain standing without additional bracing, shoring, or lateral support until demolished. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.2 Protection of Existing Property

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.3 Protection From the Weather

Materials and equipment designated in the specifications or drawings to be salvaged and reused shall be protected from the weather at all times.

1.5.4 Protection of Trees

Trees within the project site which might be damaged during demolition and which are indicated to be left in place shall be protected with high-visibility temporary construction fencing or other methods suitable to the Contracting Officer. The fence shall be securely erected a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the work under this contract

shall be replaced in kind or as approved by the Contracting Officer, at the expense of the Contractor.

1.5.5 Environmental Protection

All work shall comply with requirements of specification section \=01355A-\, ENVIRONMENTAL PROTECTION.

1.6 BURNING

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

1.7 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EXISTING STRUCTURES AND IMPROVEMENTS

Existing structures and improvements within the limits of excavation indicated shall be removed in their entirety. Removals shall include but are not limited to: Sidewalks, curbs, concrete curb stops (bumpers), shopping cart storage racks, gutters, traffic signal poles, and street lights. All required removals are shown on the drawings.

Prior to removal/demolition of existing features, it shall be the Contractor's full responsibility to tie down the horizontal locations of all existing site features to be removed during demolition that are to be replace/restored in their original locations during restoration. Horizontal locations shall be determined via survey or other precise methods and appropriate documentation shall be made by the Contractor.

Typical features to be replaced would include landscape & islands, curbs, gutters, sidewalks, signs, shopping cart storage racks, traffic signals, light poles, and pavement markings.

3.2 UTILITIES

Other than as specified below, existing utilities which physically conflict with the proposed construction will be relocated by others. Remove and properly dispose of existing, abandoned utility lines within the limits of excavation indicated. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area.

3.2.1 Fiber-Optic Communication Lines

Where indicated, fiber-optic communication lines are present within the limits of excavation, and are to remain in place and in service throughout the construction period. Contractor shall develop and implement a plan for the protection and support of those lines, and shall bear full responsibility for such protection and support (see paragraph 1.3, Submittals).

3.3 NOT USED

3.4 DISPOSITION OF MATERIAL

Title to material and equipment to be demolished is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.4.1 Salvageable Items and Material

Contractor shall salvage items and material to the maximum extent possible.

3.4.1.1 Material Salvaged for the Contractor

Material salvaged for the Contractor shall be stored as approved by the Contracting Officer and shall be removed from the project right-of-way before completion of the contract. Material salvaged for the Contractor shall not be sold on site or within the limits of the project right-of-way.

3.4.1.2 Not Used

3.4.1.3 Not Used

3.4.1.4 Not Used

3.4.1.5 Items Salvaged for Reuse

To the maximum practicable extent, existing items such as shopping cart storage racks, street and parking lot light poles and associated hardware, and information signs shall be salvaged and reinstalled at their present location unless otherwise indicated. Contractor shall replace any such items which are damaged or otherwise determined to be unsuitable for reinstallation and reuse with new items of similar design and construction.

3.4.2 Unsalvageable Material

Unsalvageable materials shall be classified as to the type of waste in accordance with federal, state, and local regulations and segregated prior to disposal. Disposal of materials outside the project right-of-way shall be in accordance with federal, state, and local regulations. The location of any disposal facility located outside the project right-of-way shall be submitted to the Contracting Officer prior to removal of any material or waste from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the type of waste. No material shall be removed from the site without prior approval from the Contracting Officer.

3.5 CLEAN UP

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

3.6 PAVEMENTS

Existing pavements designated for removal shall be saw cut full depth, and removed in accordance with details and to the limits shown on the drawings.

SECTION 02110

CLEARING AND GRUBBING
07/89

PART 1 GENERAL

1.1 REFERENCES (Not Applicable)

1.2 DEFINITIONS

1.2.1 Clearing
Clearing shall consist of felling, trimming, and cutting trees into sections and the satisfactory disposal of trees and other vegetation designated for removal, including down timber, snags, brush, and rubbish occurring in the areas to be cleared. Clearing and grubbing of trees shall be limited to trees that measure less than 12 inches in diameter at a height 4 feet above the ground surface.

1.2.2 Grubbing
Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas.

1.3 SUBMITTALS
Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Materials Other Than Salable Timber;

Written permission to dispose of such products on private property shall be filed with the Contracting Officer.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CLEARING
Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 1-1/2 inches or more in diameter and shall be trimmed of all branches to the heights indicated or directed. Limbs and branches to be trimmed shall be neatly cut close to the bole of the tree or main branches. Cuts more than 1-1/2 inches in diameter shall be painted with an approved tree-wound paint. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.2 GRUBBING
Material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, shall be removed to a depth of not less than 18 inches below the original surface level of the ground in all areas within the construction limits indicated. Depressions made by grubbing beyond the limits of excavation indicated shall be filled with suitable material and

compacted to make the surface conform with the original adjacent surface of the ground.

3.3 NOT USED

3.4 DISPOSAL OF MATERIALS

Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations shall be disposed of outside the limits of Government-controlled land at the Contractor's responsibility. Disposal of materials shall be in accordance with federal, state, and local regulations. The location of any disposal facility located off the Government premises shall be submitted to the Contracting Officer prior to removal from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the material. No material shall be removed from the project site without prior approval from the Contracting Officer.

SECTION 02210

GRADING
12/88

PART 1 GENERAL

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM D 422-\	(1963; R 1990) Particle-Size Analysis of Soils
\-ASTM D 698-\	(1991; R1998) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
\-ASTM D 1556-\	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
\-ASTM D 2167-\	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
\-ASTM D 2216-\	(1992) Laboratory Determination of Water (Moisture) Content of Soil, and Rock
\-ASTM D 2487-\	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
\-ASTM D 2488-\	(1993) Description and Identification of Soils(Visual-Manual Procedure)
\-ASTM D 2922-\	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
\-ASTM D 3017-\	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
\-ASTM D 4318-\	(1993) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

STATE OF COLORADO, DIVISION OF HIGHWAYS, STATE DEPARTMENT OF HIGHWAYS (CDOT)

(1999) Standard Specifications for Road and Bridge Construction

1.2 NOT USED

1.3 DEFINITIONS

1.3.1 *Suitable Materials*\
Suitable materials are materials that classify according to \-ASTM D 2487-\ as GW, GP, GC, GM, SW, SP, SC, SM, CL, and ML. Lime and flyash shall also be considered as suitable materials when used as stabilizing agents.

1.3.2 Unsuitable Materials
Unsuitable materials include all materials that are not defined above as suitable materials. In addition, unsuitable materials are materials that classify according to \-ASTM D 2487-\ as MH, OH, CH, Pt, and OL. Unsuitable materials

also include all material that contains debris, refuse, roots, organic matter, frozen material, fine grained sedimentary rocks (i.e., shale, claystone, siltstone, mudstone, and marl) even though they may be intensely weathered, contamination from hazardous, toxic, biological or radiological substances, stone having a maximum dimension larger than 3 inches in any dimension, or other materials that are determined by the Contracting Officer as unsuitable for providing a stable subgrade or stable foundation for pavement. Otherwise suitable material which has excess moisture content shall not be classified as unsuitable material unless it cannot be dried by manipulation, aeration, or blending with other materials as determined by the Contracting Officer.

1.3.3 Cohesionless and Cohesive Materials
Cohesionless materials include materials classified in \-ASTM D 2487-\ as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

1.3.4 Expansive Soils
Expansive soils are defined as soils that have a plasticity index greater than 24 and a liquid limit greater than 49 when tested in accordance with \-ASTM D 4318-\.

1.3.5 Non-expansive Soils
Non-expansive soils are defined as soils with a plasticity index less than or equal to 24 and a liquid limit less than or equal to 49 when tested in accordance with \-ASTM D 4318-\.

1.3.6 Not Used

1.3.7 Acceptable Topsoil
Acceptable topsoil is defined as selectively excavated natural, friable soil that is representative of soils in the vicinity that produce heavy growths of crops, grass or other vegetation and is reasonably free from underlying subsoil, clay lumps, objectionable weeds, litter, brush, matted roots, toxic substances or any material that might be harmful to plant growth or be a hindrance to grading, planting or maintenance operations. Soil from ditch bottoms, drained ponds, eroded areas, or soil which is excessively wet or saturated is not acceptable. Topsoil shall not contain more than five percent by volume of stones, stumps or other objects larger than 1 inch in any dimension for field seeded areas and 1/2 inch in any dimension for lawn seeded areas. Topsoil shall be approved by the Contracting Officer. See Section \=02921=\ SEEDING for additional requirements.

1.3.8 Spot Subgrade Reinforcement Material
Spot subgrade reinforcement material includes sound, tough, durable crushed stone, slag or gravel, consisting of pieces varying from 1 inch to 3-1/2 inches in diameter, or other approved material, with necessary filler. When a finer material is necessary for filler, broken stone chips, screened gravel, or sand may be used to completely fill all voids.

1.3.9 Drain Blanket and Gravel Drainage Material
Material designated as drain blanket or gravel drainage material shall consist of clean, durable, free-draining sand or crushed stone conforming to gradation requirements specified in CDOT Section 703.09 Filter Material, Class A.

1.3.10 Suitable Organic Soil
Suitable organic soil shall consist of cohesive, organic rich soil obtained from the existing Van Bibber Creek from station 6+10 to the upstream side of the box culvert at Oak Street. This soil shall be used in the wetland mitigation area shown on drawing C-12 of the “Reach Upstream of New Kipling” drawing package.

1.3.11 Pavements

Pavements shall include all roads, walk areas, graveled parking or walk areas, or any other type of surfaced area for driving or walking.

1.3.12 Standard Frame and Grate or Cover
Standard frame and grate or cover shall mean heavy-duty type frame and grate or cover as a minimum.

1.3.13 Degree of Compaction
Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in \-ASTM D 698-\.

1.4 SUBMITTALS
Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the "G" designate the office that will review the submittal for the Government. The following shall be submitted in accordance with Section \=01330=\ SUBMITTAL PROCEDURES:

SD-03 Product Data

Disposal Facilities; G-AO.

Location of disposal facilities and appropriate documentation showing disposal facility is licensed to accept the type of materials removed from the project right of way. The Contractor shall specifically designate disposal areas used for any visibly contaminated materials.

Statements

Field Testing Control.

Qualifications of the commercial testing laboratory who will be performing all testing in accordance with paragraph 3.11, FIELD TESTING CONTROL.

SD-09 manufacturer's Filed Reports

Field Testing Control.

Suitable Materials.

Certified test reports and analysis for all tests conducted in accordance with paragraph 3.11, FIELD TESTING CONTROL.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CONSERVATION OF TOPSOIL
Topsoil shall be removed 6 inches without contamination with subsoil, and stockpiled convenient to areas for later application or at locations specified. Topsoil shall be removed and stored separate from other excavated materials and piled free of roots, stones, and other undesirable materials. Any surplus of topsoil from excavations and grading shall be stockpiled in locations directed by the Contracting Officer.

3.2 CONSERVATION OF ORGANIC SOIL
Existing organic soil shall be removed from the existing Van Bibber Creek between station 6+10 and the upstream side of the box culvert at Oak Street. Soil shall be removed to a depth of 2 feet and stockpiled separate from other material for future use in the wetland mitigation area in the Reach Upstream of New Kipling, shown on drawing C-12.

3.3 EXCAVATION

Excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated including removal of existing bituminous surface course, concrete pavement and integral curb, pavement subcourses to the full depth, concrete walk, culverts, storm drains, subdrains, and storm drain and subdrain structures. Suitable excavated material shall be transported to and placed in fill areas within the limits of the work. Unsuitable material encountered within the limits of the work shall be excavated below the grade shown and replaced with suitable material as directed. Such material excavated and the selected material ordered as replacement will be paid for by an equitable adjustment of the contract price under the clause of the CONTRACT CLAUSES of the contract entitled "Changes." Unsuitable material and surplus excavated material not required for fill or backfill of excavations shall be disposed of by the Contractor at his own expense and responsibility outside the limits of the project right of way. Disposal of materials outside the project right of way shall be in accordance with federal, state, and local regulations. The location of all *disposal facilities*\ shall be submitted to the Contracting Officer prior to removing material from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the material. No material shall be removed from the project site without prior approval from the Contracting Officer. The Contractor shall immediately notify the Contracting Officer if any material to be disposed of contains visible signs of contamination with hazardous, toxic, biological or radiological substances. The Contractor shall comply with all local and state regulations concerning disposal of visibly contaminated materials. During construction, excavation and filling shall be performed in a manner and sequence that will provide drainage at all times.

3.3.1 Wetland Area Mitigation Excavation

Excavation within the wetland mitigation area shall extend to elevations 5371 or 5372, 1-foot below elevations shown on drawing C-12, to allow placement of 1-foot of organic-rich soil from the existing Van Bibber Creek to support wetland plant growth. The wetland channel within the wetland mitigation area, with bottom elevation 5372, shall not be excavated 1-foot below elevations shown on drawing C-12, and shall not receive organic-rich soil.

3.3.2 Ditch Excavation

Ditches shall be cut accurately to the cross sections and grades indicated. All roots, stumps, and foreign matter in the sides and bottom of ditches shall be cut to conform to the slope, grade, and shape of the section shown. Care shall be taken not to excavate ditches below the grades indicated. Excessive ditch excavation shall be backfilled to grade with suitable, thoroughly compacted material as directed. All ditches excavated under this section shall be maintained until final acceptance of the work. Suitable material excavated from ditches shall be placed in fill areas as directed. Unsuitable and excess excavated material shall be disposed of as specified above. No excavated material shall be deposited closer than 3 feet from the edges of the ditches.

3.4 UTILIZATION OF EXCAVATED MATERIALS

Suitable material removed from required excavation under this section shall be utilized in the formation of embankments, subgrades, shoulders, slopes, bedding, backfill for culverts and other structures, and for such other purposes as directed. No excavated material shall be wasted without the authorization of the Contracting Officer. Material authorized to be wasted shall be disposed of as directed and in such manner as not to obstruct the flow characteristics of any stream or to impair the efficiency or appearance of any structure. No excavated material shall be deposited at any time in a manner that may endanger a partly finished structure by direct pressure, by overloading banks contiguous to the operations, or that may in any other way be detrimental to the completed work.

3.5 BACKFILL ADJACENT TO STRUCTURES

Backfill adjacent to structures shall be placed and compacted uniformly in such manner as to prevent wedging action or eccentric loading upon or against the structures. Slopes bounding or within areas to be backfilled shall be stepped or serrated to prevent sliding of the fill. During backfilling operations and in the formation of embankments, equipment that will overload the structure in passing over and compacting these fills shall not be used. Backfill for culverts and storm drains, including the bedding, shall conform to the additional requirements as specified in Section \=02720=\ STORM-DRAINAGE SYSTEM. Backfill for structures other than culverts and storm drains shall conform to the additional requirements in Section \=02222=\ EXCAVATION, TRENCHING, AND BACKFILLING FOR STRUCTURES AND UTILITIES SYSTEMS.

3.6 PREPARATION OF GROUND SURFACE FOR FILL

All vegetation, such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsuitable material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will unsuitable material remain in or under the fill area. Stumps, logs and roots more than mm^\ 1-1/2 inch in diameter shall be excavated and removed to a depth not less than 18 inches below the original ground surface. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be plowed, stepped, or broken up, as directed, in such manner that the fill material will bond with the existing surface. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as may be required to obtain the specified moisture content and density.

3.7 FILLS AND EMBANKMENTS

Fills and embankments herein designated as fills shall be constructed at the locations and to lines and grades indicated on the drawings. The completed fill shall correspond to the shape of the typical sections shown on the drawings and shall meet the requirements of the particular case. Suitable material removed from the excavation shall be used in forming the necessary fill. Where otherwise suitable material is too wet, it shall be aerated or dried to provide the moisture content specified for compaction. Material shall be placed in successive horizontal layers not to exceed 8 inches in loose lift thickness for the full width of the cross section, and compacted. Each layer shall be compacted before the overlaying lift is placed.

3.8 COMPACTION

Compaction shall be accomplished by means specified and to the following densities for various parts of the work. Deficiencies in construction shall be corrected by the Contractor at no additional cost to the Government.

3.8.1 Over-all or Overlot Areas

Each layer of fills constructed under this section except for topsoil shall be compacted to at least 90 percent of the maximum density as determined in paragraph 1.3.13, Degree of Compaction. Cohesive soils shall be at a moisture content between 1 percent below and 4 percent above optimum moisture when compacted. Cohesionless soils shall be compacted at a moisture content as required to facilitate compaction without bulking.

3.8.2 Areas to Receive Pavements

All fills for paved areas shall be compacted as specified in paragraph 3.8.1 for Over-all or Overlot Areas, with the following exception. The upper layer forming the subgrade for pavements in both cut and fill areas, shall be compacted to at least 95 percent of maximum density as determined in paragraph 1.3.13, Degree of Compaction.

3.8.2.1 Subgrade Preparation

The subgrade shall be shaped to line, grade and cross section with approved compaction equipment so as to provide a minimum compacted subgrade thickness of 6 inches. This operation shall include any reshaping, aeration, wetting, or drying required. The subgrade in cut sections shall be scarified and excavated for the full depth of compacted subgrade indicated on the drawings, and the excavated material shall be windrowed and bladed successively until thoroughly blended, then relaid and compacted. The subgrade in fill sections shall be windrowed and bladed successively until thoroughly blended, then compacted. Cohesionless soils shall be compacted as required to facilitate compaction without bulking. All unsuitable material shall be removed and replaced with suitable material from excavation or, if so directed, with spot subgrade reinforcement material, all as approved by the Contracting Officer. Spot subgrade reinforcement, if required, will be paid for by an equitable adjustment of the contract price under the clause Entitled "Changes" of the CONTRACT CLAUSES. All boulders or ledge stone encountered in the excavation shall be removed or broken off to a depth of not less than 6 inches below the subgrade. The resulting area and all other low sections, holes, or depressions shall be brought to the required grade with suitable material and the entire subgrade shaped to line, grade and cross section and thoroughly compacted as herein provided. Subgrade compaction shall be extended to include the shoulders.

3.8.2.2 Spot Subgrade Reinforcement

The use of spot subgrade reinforcement material shall be at the direction of and subject to the approval of the Contracting Officer. Unsuitable subgrade materials shall be removed, the bottom of the resulting excavation shaped uniformly and compacted firmly to the density specified for subgrade, and the required provisions for adequate drainage shall be made. The subgrade reinforcement material shall then be placed in the prepared excavation, in layers of not more than 8 inches, which shall be spread and rammed until level with the surrounding subgrade surface. The voids shall then be filled with necessary finer selected material and the area rolled, or tamped if inaccessible to the roller. The filling and rolling or tamping shall be continued until the entire mass is thoroughly compacted to not less than the density of the surrounding or adjacent areas. The surface shall be finished to conform accurately to the grade and cross section shown on the drawings.

3.8.3 Drain Blanket and Gravel Drainage Material

Each lift of drain blanket and gravel drainage material shall be compacted with a minimum of 3 passes of a plate-type vibratory compactor approved by the Contracting Officer prior to use.

3.8.4 Organic-Rich Soil

Organic-rich soil in the wetland mitigation area shall not be compacted.

3.9 PLACING TOPSOIL

All ground areas disturbed by construction under this contract and not built over, paved or otherwise surfaced shall be topsoiled.

3.9.1 Clearing

Prior to placing topsoil, vegetation shall be removed from the area and the ground surface cleared of all other materials that would hinder proper grading, tillage or subsequent maintenance operations.

3.9.2 Grading

Previously constructed grades shall be repaired if necessary so that the areas to be topsoiled shall conform to the section indicated on the drawings upon completion of topsoil placement.

3.9.3 Tillage

Subsequent to the above grading, the areas to be top-soiled shall be thoroughly scarified by approved means to a depth of at least 3 inches for bonding of topsoil with subsoil. The work shall be performed only during periods when

beneficial results are likely to be obtained. When conditions are such, by reason of drought, excessive moisture, or other factors, that satisfactory results are not likely to be obtained, the work will be stopped by the Contracting Officer and shall be resumed only when directed by the Contracting Officer. Undulations or irregularities in the surface that would interfere with further construction operations or maintenance shall be leveled before the next specified operation.

3.9.4 Placing Topsoil

Topsoil shall be uniformly distributed on the designated areas and evenly spread to a minimum thickness of 6 inches. Spreading shall be performed in such manner that planting can proceed with little additional soil preparation or tillage. The resulting surface shall meet the finish surface requirements specified in the following paragraph 3.12, FINISHED EXCAVATION, FILLS AND EMBANKMENTS. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading or the proposed planting.

3.10 PLACING ORGANIC-RICH SOIL

Organic-rich soil from the existing Van Bibber Creek shall be placed within the wetland mitigation area with the exception of the wetland channel that shall not be over excavated 1-foot and shall not receive organic-rich soil. Organic-rich soil shall not be contaminated or mixed with other soil prior to or during placement. Organic rich soil shall be placed to a thickness of 12 inches in all areas of the wetland mitigation area shown to be at final grade elevation 5372 or 5373, with the exception of the wetland channel. Reference drawing C-12 of the upstream package.

3.11 \+*FIELD TESTING CONTROL*\+\

3.11.1 Sampling and Testing

All quality control sampling and testing shall be performed by the Contractor in accordance with Section \=01451=\ CONTRACTOR QUALITY CONTROL and as specified herein.

3.11.2 Moisture-Density Determinations

Tests for determination of maximum density and optimum moisture shall be performed by the Contractor in accordance with \-ASTM D 698-\, except that a mechanical tamper may be used provided the results are correlated with those obtained with the referenced hand tamper. Samples shall be representative of the materials to be placed. An optimum moisture-density curve shall be obtained for each principal type of material or combination of materials encountered or utilized. Results of these tests shall be the basis of control for compaction. The above testing shall include Atterberg limits, grain size determinations and specific gravity. A copy of these tests shall be furnished to the Contracting Officer with the construction quality control daily report.

3.11.3 Density Control

The Contractor shall adequately control his compaction operations by tests made in accordance with any of the following methods: \-ASTM D 1556-\, \-ASTM D 2167-\, or \-ASTM D 2922-\ and \-ASTM D 3017-\ to insure placement of materials within the limits of densities specified. When \-ASTM D 2922-\ is used, the calibration curves shall be checked, and adjusted if necessary, using the sand cone method as described in paragraph "Calibration" of \-ASTM D 2922-\. \-ASTM D 2922-\ results in a wet unit weight of soil and when using this method, \-ASTM D 3017-\ shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with the density calibration checks as described in \-ASTM D 3017-\. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, at intervals as directed by the Contracting Officer. If \-ASTM D 2922-\ is used for field density control, there

should be at least one test performed according to \-ASTM D 1556-\ per every 10 tests performed according to \-ASTM D 2922-\ for correlation of test results. One test shall be made for each 3,000 sq. yds. or less for each layer of specified depth, except areas to receive pavements, for which one test shall be made for each 1,000sq. yds. or less for each layer. Additional tests shall be made as necessary. All test results shall be made available to the Contracting Officer. Acceptance tests may be made by the Government for verification of compliance; however, the Contractor shall not depend on such tests for his control of operations. Deficiencies in construction shall be corrected by the Contractor at no additional cost to the Government.

3.12 FINISHED EXCAVATION, FILLS, AND EMBANKMENTS

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall be not more than 0.15 foot above or below the established grade or approved cross section and shall be free of depressed areas where water would pond. All ditches shall be finished so as to drain readily. The surface of embankments or excavated areas for road construction or other areas to be paved on which a base course or pavement is to be placed shall not vary more than 0.05 foot from the established grade and approved cross section.

3.13 PROTECTION

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along the subgrade shall be maintained in such manner as to drain effectively at all times. Where ruts occur in the subgrade, the subgrade shall be brought to grade, reshaped if required, and recompacted prior to placing surfacing materials. Storage or stockpiling materials on the subgrade will not be permitted. No surfacing shall be laid until the subgrade has been checked and approved, and in no case shall any surfacing be placed on a muddy subgrade or on one containing frost. Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes. All work shall be conducted in accordance with the environmental protection requirements of the contract.

3.13.1 Protection of Existing Service Lines and Utilities Structures

Existing utility lines that are shown on the drawings, or the locations of which are made known to the Contractor prior to excavation that are to be retained, as well as utility lines constructed during excavation operations, shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired by the Contractor at his expense. In the event that the Contractor damages any existing utility lines that are not shown, or the locations of which are not made known to the Contractor, report thereof shall be made immediately to the Contracting Officer. If determined that repairs are to be made by the Contractor, such repairs will be made in accordance with the clause Entitled "Changes" of the CONTRACT CLAUSES. When utility lines that are to be removed or relocated are encountered within the area of operations, the Contractor shall notify the Contracting Officer in ample time for the necessary measures to be taken to prevent interruption of the service.

3.14 ADJUSTMENT OF EXISTING STRUCTURES

All manholes, valve boxes, or inlets of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where inlets, manholes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new conditions. All structures shall be

of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications.

SECTION 02222

EXCAVATION, TRENCHING, AND BACKFILLING FOR STRUCTURES AND UTILITIES SYSTEMS

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM D 422-\	(1963; R 1990) Particle-Size Analysis of Soils
\-ASTM D 698-\	(1991; R1998) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
\-ASTM D 1556-\	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
\-ASTM D 2167-\	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
\-ASTM D 2487-\	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
\-ASTM D 2922-\	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
\-ASTM D 3017-\	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

STATE OF COLORADO, DIVISION OF HIGHWAYS, STATE DEPARTMENT OF HIGHWAYS(CDOT)

(1999) Standard Specifications for Road and Bridge Construction

1.2 NOT USED

1.3 DEFINITIONS

1.3.1 Degree of Compaction

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in \-ASTM D 698-\.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with Section \=01330=\ SUBMITTAL PROCEDURES:

SD-09 Manufacturer’s Field Reports

Disposal Facilities; G-AO

Location of disposal facilities and appropriate documentation showing disposal facility is licensed to accept the type of material

Field Density Tests; G-AO.

Testing of Backfill Materials;

Copies of all laboratory and field test reports within 24 hours of completion of the test.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Suitable Materials

Suitable materials are materials that classify according to \-ASTM D 2487-\ as GW, GP, GM, GC, SW, SP, SM, SC, CL,and ML. Lime and flyash shall also be considered as suitable materials when used as stabilizing agents.

2.1.2 Unsuitable Materials

Unsuitable materials include all materials that are not defined above as suitable materials. In addition, unsuitable materials are materials that classify according to \-ASTM D 2487-\ as MH, OH, CH, Pt, and OL. Unsuitable materials also include all material that contains debris; refuse; roots; organic matter; frozen material; fine-grained sedimentary rocks (i.e., shale, claystone, siltstone, mudstone, and marl) even though they may be intensely weathered; contamination from hazardous; toxic; biological or radiological substances; stones larger than 3 inches in any dimension; or other materials that are determined by the Contracting Officer as unsuitable for providing a stable subgrade or stable foundation for utilities. Otherwise suitable material which has excess moisture content shall not be classified as unsuitable material unless it cannot be dried by manipulation, aeration, or blending with other materials as determined by the Contracting Officer.

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials shall include materials classified in \-ASTM D 2487-\ as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

2.1.4 Not Used

2.1.5 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than 3 inches in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.6 Unstable Material

Unstable material shall consist of suitable materials too wet to properly support the utility pipe, conduit, or appurtenant structure as determined by the Contracting Officer.

2.1.7 Select Granular Material

Select granular material shall meet requirements of drain blanket material in paragraph 2.1.12.

2.1.8 Not Used

2.1.9 Not Used

2.1.10 Initial Backfill Material

Initial backfill shall consist of select granular material or suitable materials free from rocks 3 inches or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller.

2.1.11 Not Used

2.1.12 Drain Blanket

Material for Drain Blanket shall consist of free draining sand, gravel or crushed stone conforming to the gradation specified in CDOT Section 703.09 Filter Material, Class A.

2.1.13 SAND

Sand shall be free from clay or organic material, suitable for the purpose intended, and shall be of such size that 90 percent to 100 percent shall pass a No.4 sieve and not more than 5 percent shall pass a No. 200 sieve.

2.2 EQUIPMENT

2.2.1 Dewatering

The Contractor shall provide and maintain adequate dewatering equipment to remove and dispose of all surface and ground water entering excavations, trenches, or other parts of the work. Dewatering may be necessary to install the relocated water main shown on drawing U-3 of the downstream package. If necessary, the Contractor shall continuously maintain groundwater at an elevation at least 12 inches below the bottom of finished grade elevation shown on the drawings. The Contractor shall comply with all state and local requirements regarding disposal of surface and groundwater during dewatering activities, and specification section 01355A, ENVIRONMENTAL PROTECTION.

PART 3 EXECUTION

3.1 EXCAVATION

During excavation, material suitable for backfilling shall be stockpiled in an orderly manner at a distance from the top slope line of the trench equal to 1/2 the depth of the excavation, but in no instance closer than 3 feet from the top slope line of the trench. Unsuitable or surplus suitable material not required for fill or backfill of excavations shall be disposed of by the Contractor at his own expense and responsibility outside the limits of the project right of way. Disposal of materials outside the project right-of-way shall be in accordance with federal, state, and local regulations. The location of all *disposal facilities*\ shall be submitted to the Contracting Officer prior to removal from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the material. No material shall be removed from the project site without prior approval from the Contracting Officer. The Contractor shall immediately notify the Contracting Officer if any material to be disposed of contains visible signs of contamination with hazardous, toxic, biological or radiological substances.

Grading shall be done as necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized overexcavation shall be backfilled in accordance with paragraph 3.2, BACKFILLING AND COMPACTION, at the cost of the Contractor.

3.1.1 Trench Excavation

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than 5 feet high shall be shored, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Vertical trench walls more than 5 feet high shall be shored. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. The trench width below the top of pipe shall not exceed 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter and shall not exceed 36 inches plus pipe outside diameter for sizes larger than 24 inches inside diameter. Where recommended trench widths are exceeded, redesign, stronger pipe, or special installation procedures shall be utilized by the Contractor. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the Contractor at the expense of the Contractor.

3.1.1.1 Bottom Preparation

Trench bottoms shall be over excavated to allow the installation of granular bedding as detailed on the drawings. Trench bottoms shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.1.1.2 Removal of Unyielding Material

Where unyielding material is encountered in the bottom of the trench, such material shall be removed 4 inches below the required grade and replaced with suitable materials as provided in paragraph 3.2, BACKFILLING AND COMPACTION.

3.1.1.3 Removal of Unsuitable or Unstable Material

Where unsuitable or unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material as provided in paragraph 3.2, BACKFILLING AND COMPACTION. When removal of unsuitable or unstable material is required due to the fault or neglect of the Contractor in his performance of the work, the resulting material shall be excavated and replaced by the Contractor at the expense of the Contractor.

3.1.1.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. Rock shall be cleaned of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Loose disintegrated rock and thin strata shall be removed. Removal of unsuitable or unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be

taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.1.1.5 Not Used

3.1.1.6 Stockpiles

Stockpiles of suitable materials shall be placed and graded as specified. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. Adequate drainage shall be provided for the stockpiles and surrounding areas by means of ditches, dikes, or other approved methods. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber-tired equipment, excavated suitable and unsuitable materials shall be separately stockpiled. Stockpiles of suitable materials shall be protected from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsuitable, such material shall be removed and replaced with suitable material from approved sources at the expense of the Contractor. Locations of stockpiles of suitable materials shall be subject to prior approval of the Contracting Officer.

3.1.1.7 Dewatering

Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed, therein is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result. Surface water shall be diverted or otherwise prevented from entering excavated areas or trenches to the greatest extent practicable without causing damage to adjacent property. The Contractor shall dispose of all water generated during dewatering activities in accordance with SECTION \=01355A=\ ENVIRONMENTAL PROTECTION. The Contractor shall be responsible for all damage incurred to the drainage facilities as a result of dewatering operations. All pipe or conduits shall be left clean and free of sediment.

3.2 BACKFILLING AND COMPACTION

Backfill material shall consist of suitable material, select granular material, or initial backfill material as required. Backfill shall be placed in layers not exceeding 6 inches loose thickness for compaction by hand operated machine compactors, and 8 inches loose thickness for other than hand operated machines, unless otherwise specified. The moisture content of cohesive soil shall be between 1 percent below and 3 percent above optimum moisture when compacted. Cohesionless soils shall be compacted at a moisture content as required to facilitate compaction without bulking. Each layer shall be compacted to not less than the percentage of laboratory maximum density specified below:

	Percentage Laboratory Maximum Density	
	Cohesive Material	Cohesionless Material
Native Soil and Backfill		
Beneath Buildings and Structures	95	97
Under Sidewalks and Grassed Areas	Ref specification 02210, GRADING	
Grassed Areas	90	95

3.2.1 Trench Backfill

Trenches shall be backfilled to the grade shown. The trench shall not be backfilled until all specified tests are performed.

3.2.1.1 Replacement of Unyielding Material

Unyielding material removed from the bottom of the trench shall be replaced with select granular material or initial backfill material.

3.2.1.2 Replacement of Unsuitable or Unstable Material

Unsuitable or unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 6 inches loose thickness.

3.2.1.3 Initial Backfill

Initial backfill shall be placed in 6-inch loose thickness layers and compacted to at least 90 percent of maximum density within moisture content ranges as specified in paragraph 3.2, BACKFILLING AND COMPACTION. Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe.

3.2.1.4 Bedding

Bedding shall consist of select granular materials, as defined in paragraph 2.1.7, SELECT GRANULAR MATERIAL. Material shall be deposited in 6-inch loose layers and compacted with approved methods to at least 95 percent maximum density. Care shall be taken to ensure thorough compaction of the fill under the pipe haunches. Bedding shall consist of select granular materials.

3.2.1.5 Final Backfill

The remainder of the trench, except for special materials for roadways, shall be filled with suitable material. Backfill material shall be placed and compacted as follows:

a. Roadways: Backfill shall be placed up to the elevation at which the requirements in Section \=02210=\ GRADING, control. Water flooding or jetting methods of compaction will not be permitted.

b. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Backfill shall be deposited and compacted in accordance with Section \=02210=\ GRADING. Compaction by water flooding or jetting will not be permitted. This requirement shall also apply to all other areas not specifically designated above.

3.2.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed and the concrete has been allowed to cure for 7 days backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.3 NOT USED

3.4 TESTING

Testing shall be the responsibility of the Contractor and shall be performed at the expense of the Contractor.

3.4.1 Testing Facilities

Tests shall be performed by an approved commercial testing laboratory or may be tested by facilities furnished by the Contractor. No work requiring testing will be permitted until the facilities have been inspected and approved by the Contracting Officer. The first inspection shall be at the expense of the Government. Cost incurred for any subsequent inspection required because of failure of the first inspection will be charged to the Contractor.

3.4.2 *Testing of Backfill Materials*\

Characteristics of backfill materials shall be determined in accordance with particle size analysis of soils \-ASTM D 422-\ and moisture-density relations of soils \-ASTM D 698-\. A minimum of one particle size analysis and one moisture-density relation test shall be performed on each different type of material used for bedding and backfill.

3.4.3 *Field Density Tests*\

Tests shall be performed in sufficient numbers to ensure that the specified density is being obtained for each lift. A minimum of one field density test per lift of backfill for every 150 feet of installation shall be performed. One moisture density relationship shall be determined for every 1500 cubic yards of material used. Field in-place density shall be determined in accordance with \-ASTM D 1556-\ \-ASTM D 2167-\ or \-ASTM D 2922-\. When \-ASTM D 2922-\ is used, the calibration curves shall be checked and adjusted using the sand cone method as described in paragraph Calibration of the ASTM publication. \-ASTM D 2922-\ results in a wet unit weight of soil and when using this method, \-ASTM D 3017-\ shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in \-ASTM D 3017-\. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, or at intervals as directed by the Contracting Officer. Copies of calibration curves, results of calibration tests, and field and laboratory density tests shall be furnished to the Contracting Officer. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at the expense of the Contractor.

3.4.4 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to the finished grade surface, the pipe shall be inspected to determine whether significant displacement has occurred. This inspection shall be conducted in the presence of the Contracting Officer. Pipe sizes larger than 36 inches shall be entered and examined, while smaller diameter pipe shall be inspected by shining a light or laser between manholes or manhole locations, or by the use of television cameras passed through the pipe. If, in the judgement of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed at the expense of the Contractor.

3.5 PAVEMENT AND WALK REMOVAL AND REPLACEMENT

Disposal of paving materials outside the project right-of-way shall be in accordance with federal, state, and local regulations. The location of any *disposal facilities*\ located outside of the limits of the project right-of-way shall be submitted to the Contracting Officer prior to removal from the project site. The Contractor shall submit documentation from the disposal facility to verify that it is licensed to accept the material. No material shall be removed from the project site without prior approval from the Contracting Officer. The Contractor shall notify the Contracting Officer if any material to be disposed of is found to contain hazardous, toxic, biological or radiological substances.

3.5.1 Flexible Pavement

Where construction requires cutting and replacing of flexible pavement, cutting shall be so accomplished that the remaining exposed edges shall conform vertically and horizontally to a straight line. The full depth of surface and binder course shall be removed to a point 1 foot back from the edge of new base course with a saw cut on the edges. Base course shall be removed to a point 6 inches back from each side of the trench. The replaced pavement shall match the existing in section and depth and shall conform to SECTION: \=02552=\ BASE COURSE, BITUMINOUS SURFACE COURSES, AND BITUMINOUS TACK AND PRIME COATS, and SECTION: \=02241=\ CRUSHED AGGREGATE. Concrete curb and gutter shall be removed to the nearest joint. Saw cutting to a minimum depth of 1 inch will be permitted if the remaining section to the next joint is 4 feet or more. Replaced section shall match the adjacent curb and gutter and shall be 3,500 psi concrete, air-entrained. Waste materials shall be disposed of as specified in Paragraph 3.5, PAVEMENT AND WALK REMOVAL AND REPLACEMENT.

3.5.2 Rigid Pavement

Where construction requires removal and replacement of rigid pavement, the cutting shall be accomplished by a concrete saw; minimum depth of vertical cut shall be 1 inch. Width of section removed shall be such that no area of pavement removed or replaced and no adjacent slab or portion of slab which remains in the pavement abutting the replacement slab shall have length or width between joints of less than 10 feet. Replaced pavement shall match the adjacent pavement and shall be psi air-entrained concrete. Integral curb shall match the adjacent curb. Concrete rubble resulting from the above operations shall be disposed of as specified in Paragraph 3.5, PAVEMENT AND WALK REMOVAL AND REPLACEMENT.

3.5.3 Walks

Where construction requires removal and replacement of concrete walks, removal shall be to the nearest joint. Saw cutting to a minimum depth of 1 inch will be permitted if the remaining section to the nearest joint is 4 feet or more. Replaced walk shall match the adjacent walk and shall conform to SECTION: \=02511=\ SIDEWALKS AND CURBS AND GUTTERS.

SECTION 02240

STONE (RIPRAP) PROTECTION

PART 1 GENERAL
1.1. SUMMARY
1.2. REFERENCES
1.3. SUBMITTALS

PART 2 PRODUCTS
2.1. MATERIALS

PART 3 EXECUTION
3.1. INTERMEDIATE COURSE MATERIAL
3.2. BEDDING MATERIAL
3.3. RIPRAP
3.4. PLACEMENT
3.5. PROTECTION

SECTION 02240

STONE (RIPRAP) PROTECTION

PART 1. GENERAL

1.1. SUMMARY

The work covered by this section consists of furnishing all plant, labor, equipment and materials, and performing all operations in connection with the construction of stone protection for the channel in accordance with this specification and as shown on the plans and as directed by the Contracting Officer's Representative. Stone protection material shall consist of all stone to be furnished for riprap and granular bedding material. The Contractor shall control operations during production of stone protection material to ensure material delivered and placed will meet all specification requirements. The Contractor shall perform all sampling and testing required for quality control in accordance with specification section \=01451=\ CONTRACTOR QUALITY CONTROL, and as specified herein. Quarry operators shall be responsible for operating and conditioning all quarry areas (after operations are complete) in accordance with all applicable Federal, State, and local laws and regulations.

Requirements for grouted stone boulders are found in specification section \=02246=\, GROUTED STONE BOULDER CONSTRUCTION.

1.2. REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

\-AASHTO T 103-78\	(1978) Soundness of Aggregates by Freezing and Thawing (Ledge Rock-Large Specimen)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM C 33-\	(1990) Concrete Aggregates
\-ASTM C 88-\	(1990) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
\-ASTM C 127-\	(1993) Specific Gravity and Absorption of Coarse Aggregate
\-ASTM C 136-\	(1995a) Sieve Analysis of Fine and Coarse Aggregates
\-ASTM C 535-\	(1989) Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
\-ASTM C 881-\	(1999) Epoxy-Resin-Base Bonding Systems for Concrete
\-ASTM C 1107-\	(1999) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

\-ASTM D 75-\	(1992) Standard Practice for Sampling Aggregates
\-ASTM D 5519-\	(1994) Particle Size Analysis of Natural and Man-Made Riprap Materials

1.3. SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the "G" designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-09 Test Reports

Gradation Test Results; G-AO. (see paragraph 3.3)

Field gradation test results of riprap, intermediate course, and bedding material shall be submitted within 10 days of test completion.

Initial Tests; G-AO. (see paragraph 2.1.6.2)

Initial tests, source, legal description, geologic formation and member, and service record for stone protection.

Waybills and Delivery Tickets;

1.4. *WAYBILLS AND DELIVERY TICKETS*

Copies of waybills or delivery tickets shall be submitted as stone protection material is being delivered to the job site. Before final payment, waybills and certified delivery tickets shall be furnished for all stone protection materials used to complete the project.

PART 2. PRODUCTS

2.1. MATERIALS

2.1.1. General Requirements

All stone for stone protection shall be durable quarried rock as approved by the Contracting Officer's Representative. Individual pieces of stone protection in-place on the embankment shall be free from cracks, seams, and other defects that will cause rapid or excessive deterioration or degradation during service. The bulk stone protection material delivered to the project shall be of such quality that tests performed on representative samples meet all specification requirements. Stone protection shall contain not more than 5 percent of undesirable material by weight. Undesirable material is defined as individual pieces of stone which do not meet quality requirements when tested as specified herein and which can be visually differentiated from satisfactory pieces, plus dirt, sand, clay, and rock fines.

The Contractor shall select the source or sources of material proposed for use and complete initial sampling and testing of materials from each source at least 30 days prior to the time the material is required at the job site.

Stone protection material shall not contain disintegrated granite or shale, smectites, or expanding lattice clay minerals. Stone protection material shall meet the following requirements when tested as specified.

2.1.2. Bulk Specific Gravity

Bulk specific gravity shall be computed based on \-ASTM C 127-\, subject to requirements listed below. Stone protection material shall be tested in a saturated surface-dry (SSD) condition. The computed bulk specific gravity so determined shall not be less than 2.65.

Total sample shall weigh 5000 grams +2 percent.
Individual particles shall weigh approximately 300 grams each.

2.1.3. Soundness in Magnesium Sulfate

Soundness in magnesium sulfate shall be determined according to \-ASTM C 88-\, subject to requirements in the following paragraphs. The combined loss at 5 cycles shall be not more than 8 percent.

2.1.3.1. Sample Preparation.

The sample shall be prepared by breaking it into fragments reasonably uniform in size and shape and weighing approximately 100 grams each. The test sample shall weigh 5000 grams +/- 2 percent. The sample shall be thoroughly washed and dried prior to test for coarse aggregate as defined in \-ASTM C 88-\.

2.1.3.2. Sample Immersion and Temperature.

The sample immersed in the solution shall be maintained at a temperature of 80 degrees +/- 2 degrees Fahrenheit for the immersion period.

2.1.3.3. Quantitative Examination.

At the end of the fifth cycle, the percentage loss shall be determined by the three following methods. The test report shall show the loss computed by each method; however, only the combined loss shall be used for acceptance or rejection of the material.

2.1.3.4. Loss by Breaking.

An individual piece which has broken or split into three or more fragments shall be considered to have failed the test, provided each of the three fragments is at least 10 percent of the original piece by weight. The cumulative weight of all individual pieces failing the test expressed as a percentage of the total original sample weight shall be considered the percentage loss by breaking.

2.1.3.5. Loss by Crumbling and Flaking.

After the loss by breaking has been determined, the remaining sample shall be screened on the 1/2-inch sieve and material which passes the 1/2-inch sieve shall be weighed to determine the combined loss (see paragraph 2.1.3.6, Combined Loss). The total weight of material passing the 1/2-inch sieve shall be expressed as a percentage of the total original sample weight to determine the percentage loss by crumbling and flaking.

2.1.3.6. Combined Loss.

The combined loss shall be determined by adding the total weight of material which fails by breaking to the weight of material passing the 1/2-inch sieve to arrive at a combined loss. The percentage combined loss shall be expressed as a percentage of the total original sample weight.

2.1.3.7. Stone Protection Report.

The report for stone protection rock shall show the percentages of loss calculated as described previously, and the number of pieces affected. The number of pieces affected shall be classified as to the number disintegrating, splitting, crumbling, cracking, or flaking.

2.1.4. Soundness by Freezing and Thawing

Testing for soundness by freezing and thawing shall consist of AASHTO T 103-78, Ledge Rock Method, Procedure C, subject to the following requirements.

Average loss at 50 cycles for five test specimens shall not exceed 10.0 percent.

The maximum loss of any one specimen of the five shall not exceed 35.0 percent.

The average number of "pieces" remaining in each of the five test specimens at the end of the test shall not exceed 3.0, and the maximum number of pieces remaining in any one specimen shall not exceed four.

2.1.4.1. Temperature.

The temperature of the surrounding medium during freezing shall be maintained in the range of -20 to -10 degrees Fahrenheit.

2.1.4.2. Freeze/Thaw Cycle.

The length of a freezing and thawing cycle shall be sufficient to totally freeze and totally thaw each sample particle during each cycle. The laboratory shall specifically determine for each sample that the cycle used is sufficient to accomplish total freezing and total thawing and shall report this in the test report. However, in no case shall the cycle consist of less than 2-1/2 hours of freezing followed by 1 hour of thawing. The sample shall be held in the frozen condition whenever necessary to break the cycle (overnight, weekends, etc.).

2.1.4.3. Immersion.

Procedure C, Partial Immersion shall be used, except that soaking prior to testing shall be in accordance with Procedure A.

2.1.4.4. Test Reports.

Test reports shall describe the type of failure of discrete particles.

2.1.5. Degradation by Abrasion and Impact in the Los Angeles Machine

The riprap sample shall have a percentage of wear not to exceed 40 percent after 1,000 revolutions when tested in accordance with \-ASTM C 535-\.

2.1.6. Sampling and Testing

2.1.6.1. General Requirements.

The Contractor shall perform all quality control sampling and testing. The Government may perform verification tests as determined necessary for final approval of stone protection material. All samples including samples taken during production shall be representative of stone protection material furnished

or proposed to be furnished. Samples shall be taken in conformance with \-ASTM D 75-\, or other approved methods.

Test results shall verify all furnished materials comply with requirements in this specification. If the source of material changes for any reason, material from all new sources shall be tested for compliance with specification requirements prior to placement. The Contractor may elect to place material from a new source prior to completion of testing. If deficient test results are obtained, material already placed shall be re-tested to determine the extent of unacceptable material. All in-place, unacceptable material shall be removed and replaced with acceptable material at the cost of the Contractor.

At the same time samples for initial tests are obtained, ledge or ledges in quarries sampled shall be marked with an approved semi-permanent marking which shall be readily visible during the period of riprap production. No rock shall be furnished from any ledge which has not been sampled, tested, and approved for use on this project.

2.1.6.2. /*Initial Tests*/.

Initial (prior to construction) testing shall be performed by the Contractor. The following tests shall be performed on samples of material obtained from each ledge proposed for use as stone protection prior to the start of construction:

Bulk Specific Gravity (see paragraph 2.1.2)
Soundness in Magnesium Sulfate (see paragraph 2.1.3)
Soundness by Freezing and Thawing (see paragraph 2.1.4)
Degradation by Abrasion and Impact in the Los Angeles Machine (see paragraph 2.1.5)

Certified test results performed not more than 12 months prior to delivery of proposed material to the project. Certified test results, including the name of the quarry owner and legal description of the quarry, shall be submitted to the Government. In addition, the Contractor shall submit a geologic section of each quarry proposed for use with the various rock units identified by geologic name of formation and member, and indicate from what ledge samples were obtained.

2.2. TESTING REQUIREMENTS

2.2.1. Granular Bedding Material

Granular bedding material shall be at least equal in quality to stone used for riprap and shall be well graded between specified sieves. Granular bedding material shall be quarried stone, crushed cobbles, and crushed gravel consisting of particles having at least one fractured face. The material shall be composed of tough, durable particles reasonably free from thin, flat and elongated pieces. In addition, bedding material shall contain no organic matter or soft, friable particles that classify as soil in quantities in excess of 3 percent of the total weight.

Gradation tests shall be performed on this material after final placement from locations directed by the Contracting Officer's Representative. Samples shall be obtained from each 2,500 square yards of material placed and tested for gradation according to \-ASTM C 136-\. Material shall be well graded within limits specified in Table 2.

TABLE 2
GRANULAR BEDDING MATERIAL GRADATION REQUIREMENTS

SIEVE SIZE	PERCENT PASSING BY WEIGHT
4-inch	100
3-inch	75-95
3/4-inch	40-60
3/8-inch	20-40
No. 4	5-20

2.2.2. Riprap

Riprap shall consist of stone meeting applicable requirements in Tables 3, 4 and 5. Riprap shall consist of 3 gradations (18-inch, 24-inch, and 36-inch), as indicated on the drawings. Riprap shall be in pieces approximately rectangular in cross section, free from thin slabby pieces having a maximum dimension more than four times the least dimension (elongation). Stone for riprap shall be reasonably well graded from coarse to fine. Quarry operations shall be controlled to produce a reasonably well-graded stone of required size. The Contractor's operations shall be conducted in a manner that will produce stone meeting requirements specified and shall include selective quarrying, handling, and loading as required. Soil and fines less than 1/2-inch in maximum diameter accumulated from interledge layers or from blasting or handling operations shall not exceed 5 percent by weight.

TABLE 3
18-INCH THICK RIPRAP LAYER GRADATION REQUIREMENTS

D_{100} (MAX)	PERCENT LIGHTER BY WEIGHT	LIMIT OF STONE WEIGHT IN POUNDS	
		Min	Max
18 inch	100	117	292
	50	58	86
	15	18	43

TABLE 4
24-INCH THICK RIPRAP LAYER GRADATION REQUIREMENTS

D_{100} (MAX)	PERCENT LIGHTER BY WEIGHT	LIMIT OF STONE WEIGHT IN POUNDS	
		Min	Max
24 inch	100	276	691

	50	138	205
	15	43	102

TABLE 5
36-INCH THICK RIPRAP LAYER GRADATION REQUIREMENTS

D_{100} (MAX)	PERCENT LIGHTER BY WEIGHT	LIMIT OF STONE WEIGHT IN POUNDS	
		Min	Max
36 inch	100	933	2333
	50	467	690
	15	146	345

2.2.3. Fiber-Reinforced Grout

Grout for riprap shall conform to applicable requirements of specification section \=03301=\, CAST-IN-PLACE STRUCTURAL CONCRETE.

Epoxy grout shall meet requirements of ASTM C 881, Type II. Non-shrink grout shall meet requirements of ASTM C 1107, Grades A, B, or C.

PART 3. EXECUTION

3.1. PLACEMENT

3.1.1. Granular Bedding Material

Granular bedding material shall be spread uniformly on the prepared subgrade to meet thickness and grade requirements indicated on the drawings. Placement of material by methods which result in segregation of particle sizes within the bedding shall not be permitted. Any damage to the surface of the granular bedding subgrade prior to or during placement of the bedding shall be repaired before proceeding with the work. Compaction of granular bedding material shall not be required but it shall be finished to present a reasonably even surface free from depressions, mounds, or windrows.

3.1.2. Riprap

Riprap shall be placed on the prepared subgrade or on granular bedding material as shown on the drawings. Riprap stone shall be placed in such manner as to produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids. Riprap shall be placed to its full course thickness in one operation and in such manner as to avoid damage to the bedding material and to minimize segregation of riprap. Larger stones shall be well distributed and the entire mass of stones in their final position shall be roughly graded to conform to the specified gradation. Finished riprap shall be free from pockets of small stones and clusters of larger stones. Placing riprap in layers will not be permitted. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source, or by controlled dumping of successive loads during final placement.

All stone shall be placed by means of clam, orange peel, or skip box. Zero drop height placement procedures are to be utilized for riprap stone to avoid displacing or damaging the underlying subgrade or granular bedding. Dumping of stone at the top of slopes and rolling or pushing into place shall not be permitted. Manipulating or moving stone at any time prior to placement by means of dozers or other blade equipment shall not be permitted. Rearranging of individual stones by mechanical equipment or by hand will be required to the extent necessary to obtain a reasonably well graded distribution of stone sizes as specified above.

3.1.3. Grout

Cement grout shall be placed after riprap has been constructed and accepted within gradation limits specified. Grout shall completely fill all interstics between riprap. The finished surface shall be smooth, solid, and true to line, grade, and section. Grout shall not be placed when the ambient temperature is below 35° F or above 85° F, or when grout is likely to be subjected to temperatures less than 35° F within 72 hours after placement.

3.2. *FIELD GRADATION TEST*\

A field gradation test of 18-inch, 24-inch, and 36-inch riprap materials shall be performed by the Contractor to determine if materials delivered to the job site meets gradation requirements of this specification. A sample consisting of 2 to 8 tons shall be taken of each riprap gradation delivered to the job site and checked for gradation and elongation. Gradation shall be determined according to \-ASTM D 5519-\.

Material from initial tests that meets specification requirements shall be placed in a well marked area designated by the Contracting Officer’s Representative, to serve as a visual model for acceptable material. Material that does not meet specification requirements shall not be counted as a required test. The Contractor shall provide a written statement regarding the method of blasting, processing, loading, and handling material, and shall notify the Contracting Officer’s Representative if production methods change. Riprap material shall not be placed in areas shown on the drawings until material delivered to the job site passes the field gradation test.

If material fails the field gradation test, the Contractor shall propose another source of material and verify with additional testing that acceptable materials can be produced from the new source prior to placing riprap in areas shown on the drawings.

3.3. PROTECTION

The Contractor shall maintain riprap until final acceptance by the Contracting Officer’s Representative. Material displaced by any cause shall be replaced to its original position at the expense of the Contractor.

SECTION 02241

CRUSHED AGGREGATE
04/92

PART 1 GENERAL

1.1 REFERENCES

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

Colorado Department of Transportation (CDOT) Standard Specifiations for Road and Bridge Construction, 1999 Edition.

CDOT	Section 304	Aggregate Basecourse
CDOT	Section 703.03	Aggregate For Bases

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM C 29-\	(1991a) Unit Weight and Voids in Aggregate
\-ASTM C 88-\	(1999a) Soundness of Aggregate by use of Sodium Sulfate or Magnesium Sulfate
\-ASTM C 127-\	(1988; R 1993) Specific Gravity and Absorption of Course Aggregate
\-ASTM C 128-\	(1997) Specific Gravity and Absorption of Fine Aggregate
\-ASTM C 131-\	(1996) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
\-ASTM C 136-\	(1996a) Sieve Analysis of Fine and Coarse Aggregates
\-ASTM D 75-\	(1987; R 1997) Sampling Aggregates
\-ASTM D 422-\	(1963; R 1998) Particle-Size Analysis of Soils
\-ASTM D 1556-\	(2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method
\-ASTM D 1557-\	(1991;R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-1bf/cu. ft. (2,700 kN-m/cu. m.))
\-ASTM D 2167-\	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
\-ASTM D 2922-\	(1996el) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

\-ASTM D 3017-\	(1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
\-ASTM D 4318-\	(2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
\-ASTM E 11-\	(1995) Wire-Cloth Sieves for Testing Purposes

1.2 Not Used

1.3 DEFINITIONS

1.3.1 Aggregate Base

Aggregate base as used herein is well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction.

1.3.2 Degree of Compaction

Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in \-ASTM D 1557-\ abbreviated hereinafter as percent laboratory maximum density.

1.4 GENERAL

The work specified herein consists of the construction of an aggregate base course and or rigid base course. The work shall be performed in accordance with this specification and shall conform to the lines, grades, notes and typical sections shown in the plans. Sources of all materials shall be selected well in advance of the time that materials will be required in the work. Materials and placement shall conform to CDOH Standards Sections 304 nad 703.03.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the "G" designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-03 Product Data

Plant, Equipment, Machines, and Tools.

List of proposed equipment to be used in performance of construction work including descriptive data.

SD-06 Test Reports

Aggregate; G-AO

Sampling and Testing

Field Density.

Calibration curves and related test results prior to using the device or equipment being calibrated. Copies of field test results within 24 hours after the tests are performed. Certified copies of test results for approval not less than 30 days before material is required for the work.

Copies of waybills and delivery tickets during the progress of the work. Certified waybills and delivery tickets for all materials actually used. A notification stating which type of coarse aggregate is to be used.

1.6 Not Used

1.7 Not Used

1.8 *PLANT, EQUIPMENT, MACHINES, AND TOOLS*

1.8.1 General Requirements

Plant, equipment, machines, and tools used in the work shall be subject to approval and shall be maintained in satisfactory working condition at all times. Other compacting equipment may be used in lieu of that specified, where it can be demonstrated that the results are equivalent. The equipment shall be adequate and have the capability of producing the results specified.

1.8.2 Steel-Wheeled Rollers

Steel-wheeled rollers shall be the self-propelled type weighing not less than \~10 tons,~\ with a minimum weight of \~300 pounds per inch~\ width of rear wheel. Wheels of the rollers shall be equipped with adjustable scrapers. The use of vibratory rollers is optional.

1.8.3 Not Used

1.8.4 Mechanical Spreader

Mechanical spreader shall be self-propelled or attached to a propelling unit capable of moving the spreader and material truck. The device shall be steerable and shall have variable speeds forward and reverse. The spreader and propelling unit shall be carried on tracks, rubber tires, or drum-type steel rollers that will not disturb the underlying material. The spreader shall contain a hopper, an adjustable screed, and outboard bumper rolls and be designed to have a uniform, steady flow of material from the hopper. The spreader shall be capable of laying material without segregation across the full width of the lane to a uniform thickness and to a uniform loose density so that when compacted, the layer or layers shall conform to thickness and grade requirements indicated. The Contracting Officer may require a demonstration of the spreader prior to approving use in performance of the work.

1.8.5 Sprinkling Equipment

Sprinkling equipment shall consist of tank trucks, pressure distributors, or other approved equipment designed to apply controlled quantities of water uniformly over variable widths of surface.

1.8.6 Tampers

Tampers shall be of an approved mechanical type, operated by either pneumatic pressure or internal combustion, and shall have sufficient weight and striking power to produce the compaction required.

1.8.7 Straightedge

The Contractor shall furnish and maintain at the site, in good condition, one 12-foot straightedge for use in the testing of the finished surface.

1.9 STOCKPILING MATERIALS

Materials, including approved material available from excavation and grading, shall be stockpiled in the manner and at locations designated. Before stockpiling of material, storage sites shall be cleared, and sloped to drain. Materials obtained from different sources shall be stockpiled separately.

1.10 *SAMPLING AND TESTING*

1.10.1 General Requirements

Sampling and testing shall be performed by an approved commercial testing laboratory or by facilities furnished by the Contractor. The Government reserves the right to inspect the testing lab. The first inspection shall be at the expense of the Government. Cost incurred for any subsequent inspection required because of failure of the facilities to pass the first inspection will be charged to the Contractor. Tests shall be performed in sufficient numbers and at the locations and times directed to insure that materials and compaction meet specified requirements. Copies of test results shall be furnished to the Contracting Officer within 24 hours of completion of tests.

1.10.2 Test Results

Results shall verify that materials comply with this specification. When a material source is changed, the new material will be tested for compliance. When deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place unacceptable material shall be replaced or modified as directed by the Contracting Officer.

1.10.3 Sampling

Aggregate samples for laboratory tests shall be taken in accordance with \-ASTM D 75-\.

1.10.4 Sieve Analysis

Before starting work, at least one sample of material shall be tested in accordance with \-ASTM C 136-\ and \-ASTM D 422-\ on sieves conforming to \-ASTM E 11-\.

1.10.5 Liquid Limit and Plasticity Index

Liquid limit and plasticity index shall be in accordance with \-ASTM D 4318-\.

1.10.6 Laboratory Density

Tests shall provide a moisture-density relationship for the aggregate. Tests shall be conducted in accordance with \-ASTM D 1557-\.

1.10.7 Not Used

1.10.8 Wear Tests

Wear tests shall be performed in accordance with \-ASTM C 131-\.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Aggregates

Aggregates shall consist of crushed stone or crushed gravel, angular sand, or other approved material. Aggregates shall be durable and sound, free from lumps of clay, organic matter, objectionable coatings, and other foreign material. Material retained on a No. 4 sieve shall be known as coarse aggregate and that passing the No. 4 sieve shall be known as binder material.

2.1.1.1 *Coarse Aggregate*

Coarse aggregates, consisting of angular fragments of uniform density and quality, shall have a percentage of wear not to exceed 50 percent after 500 revolutions when tested in accordance with \-ASTM C 131-\. 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.

a. Crushed Gravel: Crushed gravel shall be manufactured from gravel particles 50 percent of which by weight are retained on the maximum size gradation sieve specified.

b. Crushed Stone: Crushed stone 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.

2.1.2 Binder Material

Binder material shall consist of screenings, angular sand, or other finely divided mineral matter processed or naturally combined with the coarse aggregate. Liquid-limit and plasticity-index requirements 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 have a liquid limit not greater than 25 and a plasticity index not greater than 5.

2.1.3 Gradation

Requirements for gradation specified shall apply to the completed base course. The aggregates shall have a \2 inch~\ maximum size and shall be continuously graded within the following limits:

Sieve Designation	Percentage by Weight Passing Square-mesh Sieve (a)
	Percent Passing
2 inch	---
1-1/2 inch	100
1 inch	95-100
No. 4	30-70
No. 200	3-15

~\

(a) The values are based on aggregates of uniform specific gravity, and the percentages passing the various sieves are subject to appropriate correction in accordance with \-ASTM C 127-\ and \-ASTM C 128-\ when aggregates of varying specific gravities are used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

When the base is constructed in more than one layer, the previously constructed layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the working area. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining.

3.2 OPERATION OF AGGREGATE SOURCES

Aggregates shall be obtained from off-site sources.

3.3 PREPARATION OF UNDERLYING COURSE

3.3.1 General Requirements

Before constructing aggregate base course, the previously constructed underlying course shall be cleaned of foreign substances. Surface of underlying course shall meet the specified compaction and surface tolerances. Subgrade shall conform to Section \=02210=\ GRADING. Ruts or soft, yielding spots that may appear in the underlying course, areas having inadequate compaction, and deviations of the surface from requirements specified shall be corrected. For cohesionless underlying materials containing sands, sand gravels, or any other cohesionless material in harmful quantities, the surface shall be mechanically stabilized with aggregate prior to placement of the aggregate course. Stabilization may be accomplished by mixing base course material into the underlying course and compacting by approved methods. Properly compacted material will be considered as part of the underlying course and shall meet all requirements for the underlying course. Finished underlying course shall not be disturbed by traffic or other operations and shall be maintained in a satisfactory condition until base course is placed.

3.3.2 Grade Control

Underlying material shall be excavated to sufficient depth for the required base course thickness so that the finished base course with the subsequent surface course will meet the fixed grade. Finished and completed area shall conform to the lines, grades, cross section, and dimensions indicated.

3.4 INSTALLATION

3.4.1 Mixing and Placing

Materials shall be mixed by the stationary plant. The Contractor shall make such adjustments in mixing or placing procedures or in equipment to obtain the true grades, to minimize segregation and degradation, to reduce or accelerate loss or increase of water, and to ensure a satisfactory base course.

3.4.2 Edges of Base Course

Approved material shall be placed along edges of aggregate base course in such quantities as will compact to thickness of the course being constructed, or to the thickness of each layer in a multiple layer course, allowing in each

operation at least a 1 foot width of the shoulder to be rolled and compacted simultaneously with rolling and compacting of each layer of base course.

3.4.3 Compaction

Each layer of aggregate base course shall be compacted. Water content shall be maintained at optimum. Density of compacted mixture shall be at least 95 percent of laboratory maximum density. Rolling shall begin at the outside edge of the surface and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Alternate trips of the roller shall be slightly different lengths. Speed of the roller shall be such that displacement of the aggregate does not occur. Areas inaccessible to the rollers shall be compacted with mechanical tampers, and shall be shaped and finished by hand methods.

3.4.4 Layer Thickness

Compacted thickness of the aggregate course shall be as indicated. No layer shall be in excess of \~8 inches~\ nor less than \~3 inches~\ in compacted thickness.

3.4.5 Not Used

3.4.6 Finishing

The surface of the top layer shall be finished to grade and cross section shown. Finished surface shall be of uniform texture. Light blading during compaction may be necessary for the finished surface to conform to the lines, grades, and cross sections. Should the surface for any reason become rough, corrugated, uneven in texture, or traffic marked prior to completion, such unsatisfactory portion shall be scarified, reworked, recompacted, or replaced as directed.

3.4.6.1 Smoothness

Surface of each layer shall show no deviations in excess of \~3/8 inch~\ when tested with the \~12- foot~\ straightedge. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting, as directed.

3.4.6.2 Thickness Control

Compacted thickness of the base course shall be within \~1/2 inch~\ of the thickness indicated. Where the measured thickness is more than \~1/2 inch~\ deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, reblading, and recompacting as directed. Where the measured thickness is more than \~1/2 inch~\ thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within \~1/4 inch~\ of the thickness indicated.

3.5 FIELD QUALITY CONTROL

3.5.1 \+*Field Density*\+\

Field in-place density shall be determined in accordance with \-ASTM D 1556-\ \-ASTM D 2167-\ or \-ASTM D 2922-\. When \-ASTM D 2922-\ is used, the calibration curves shall be checked, and adjusted if necessary, using the sand cone method as described in paragraph Calibration of the ASTM publication. \-ASTM D 2922-\ results in a wet unit weight of soil, and when using this method, \-ASTM D 3017-\ shall be used to determine the moisture content of the soil. The

calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in \-ASTM D 3017-\. Calibration curves and calibration test results shall be furnished within 24 hours of the conclusion of the tests. At least one field density test shall be performed for each 250 square \~yards~\ of each layer of base material.

3.6 Not Used

3.7 MAINTENANCE

The aggregate base course shall be maintained in a satisfactory condition until accepted. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact.

3.8 DISPOSAL OF UNSATISFACTORY MATERIALS

Removed in-place materials that are unsuitable for the base course material that is removed for the required correction of defective areas, and waste material and debris shall be disposed of as directed.

SECTION 02246

GROUTED STONE BOULDER CONSTRUCTION
10/97

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM C 88-	(1990) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
\-ASTM C 127-\	(1988; R 1993) Specific Gravity and Absorption of Course Aggregate
\-ASTM C 309-\	(1995) Liquid Membrane-Forming Compounds for Curing Concrete
\-ASTM C 535-\	(1989) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
\-ASTM D 75-\	(1987; R 1992) Standard Practice for Sampling Aggregates

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

\-AASHTO T 103-78\	(1978)Soundness of Aggregates by Freezing and Thawing (Ledge Rock-Large Specimen)

ACI INTERNATIONAL (ACI)

\-ACI 305-\	(1991) Hot Weather Concreting
\-ACI 306-\	(1991) Cold Weather Concreting

1.2 GENERAL

The work specified herein consists of construction of grouted stone boulder protection for all grouted stone boulder drop structures and for construction of grouted stone boulder trickle channel sidewalls, as shown on the drawings and as directed by the Contracting Officer's Representative. This work consists of furnishing all labor, equipment, and materials and performing all work necessary to place stone boulder protection materials and to place surrounding fiber-reinforced grout material in the void areas between the stone boulders. Stone boulder material shall consist of all stone to be furnished for grouted stone boulder construction. The Contractor shall control operations during production of grouted stone boulder protection materials so as to insure that the material delivered and placed will meet all specification requirements. The Contractor shall perform all sampling and testing required for quality control in accordance with Section \=01451=\ CONTRACTOR QUALITY CONTROL and as specified herein. The quarry operators shall be responsible for operating all quarries and for conditioning the area after operations are complete, in accordance with all applicable Federal, State, and local laws and regulations.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with Section \=01330=\ SUBMITTAL PROCEDURES:

SD-06 Test Reports

Initial Sampling and Testing; G-AO.

Field Gradation; G-AO.

Field Gradation Test Results mailed within ten (10) days after completion of the tests.

Stone Protection Report; G-DO

Two (2) copies of the Stone Protection Report shall be submitted for approval within ten (10) days after completing soundness in magnesium sulfate testing (see paragraph 1.5.1.6).

Waybills and Delivery Tickets .

1.4 *WAYBILLS AND DELIVERY TICKETS*\

Copies of waybills or delivery tickets shall be submitted during the progress of the work. Before the final payment is allowed, waybills and certified delivery tickets shall be furnished for all grouted stone boulder construction materials actually used in the construction.

1.5 SAMPLING AND TESTING

1.5.1 Stone Boulder Materials

The Contractor shall be responsible for all sampling and testing specified herein. The Government may perform verification tests as determined necessary for final approval of the stone protection material. All samples including samples taken during production shall be representative of the stone boulder material furnished or proposed to be furnished. Samples shall be taken in accordance with \-ASTM D 75-\ or other approved method. No stone boulders shall be furnished from any ledge which has not been sampled, tested, and approved for use on this project.

1.5.1.1 Test Results

Results shall verify that materials comply with this specification. When a material source is changed, the new material will be tested for compliance. When deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place unacceptable material shall be replaced or modified as directed by the Contracting Officer's Representative.

1.5.1.2 *Initial Sampling and Testing*\

Tests for bulk specific gravity, soundness in freezing and thawing, and absorption shall be performed on samples of material obtained from each ledge proposed for use as stone boulder protection material prior to start of

construction. Test results shall describe type of failure of the discrete particles. Certified test results performed not longer than 12 months prior to delivery to the project together with the name of the owner of the quarry and the legal description shall be submitted to the Contracting Officer's Representative. The Contractor shall submit the name and location of each quarry proposed for use along with a geologic section of each quarry indicating the various rock units identified by geologic name of formation and member and indicate from what ledge the samples were obtained.

1.5.1.3 Bulk Specific Gravity

Bulk specific gravity shall be computed on a saturated dry basis in accordance with \-ASTM C 127-\. Stone boulder protection material shall be tested in a saturated surface-dry (SSD) condition. The computed bulk specific gravity so determined shall not be less than 2.50.

1.5.1.4 Absorption

Absorption of the proposed materials shall be determined according to \-ASTM C 127-\. Total measured absorption shall not exceed 2.0 percent.

1.5.1.5 Soundness in Freezing and Thawing

The test for freezing and thawing shall consist of \-AASHTO T 103-78\, Ledge Rock Method, Procedure A. The loss at 50 cycles shall not exceed 10.0 percent. The test report shall describe the type of failure of the discrete particles.

1.5.1.6 Soundness in Magnesium Sulfate

Soundness in magnesium sulfate shall be determined according to \-ASTM C 88-\, subject to requirements in the following paragraphs. The combined loss after 5 cycles shall not be more than 8 percent.

Sample Immersion and Temperature: The sample immersed in the solution shall be maintained at a temperature of 80 degrees +/-2 degrees Fahrenheit for the immersion period.

Quantitative Examination: At the end of the fifth cycle, the percentage loss shall be determined by the three following methods. The test report shall show the loss computed by each method; however, only the combined loss shall be used for acceptance or rejection of the material.

Loss by Breaking: An individual piece which has broken or split into three or more fragments shall be considered to have failed the test, provided each of the three fragments is at least 10 percent of the original piece by weight. The cumulative weight of all individual pieces failing the test expressed as a percentage of the total original sample weight shall be considered the percentage loss by breaking.

Loss by Crumbling and Flaking: After the loss by breaking has been determined, the remaining sample shall be screened on the 1/2-inch sieve and material that passes the 1/2-inch sieve shall be weighed to determine the combined loss (see paragraph below). The total weight of material passing the 1/2-inch sieve shall be expressed as a percentage of the total original sample weight to determine the percentage loss by crumbling and flaking.

Combined Loss: The combined loss shall be determined by adding the total weight of material that fails by breaking to the weight of material passing the 1/2-inch sieve to arrive at a combined loss. The percentage combined loss shall be expressed as a percentage of the total original sample weight.

The Contractor shall submit a stone protection report (see section 1.3, Submittals) that shows the percentages of loss calculated as described above, and the total number of pieces affected. The number of affected pieces shall be classified as to the number disintegrating; splitting; crumbling; cracking; or flaking.

1.5.1.7 Degradation by Abrasion and Impact in the Los Angeles Machine

Abrasion of the proposed stone boulder materials shall be done in conformance with \-ASTM C 535-\, using Los Angeles Machine, Grading 1. Total material weight loss after 1,000 revolutions shall not exceed 40.0 percent.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Stone Boulder Material

2.1.1.1 General Requirements

Stone boulders shall generally be round in shape. The Contractor shall furnish to the Contracting Officer’s Representative, without cost to the Owner, such samples of stone boulder materials for any testing that may be required by the Contracting Officer’s Representative from proposed quarry sites and from rock materials delivered to the site. The Contracting Officer’s Representative reserves the right to make inspections of the quarry sites and the quarries. The approval by the Contracting Officer’s Representative of some material from a particular quarry site or quarry shall not be construed as constituting the approval of all material taken from that quarry site or quarry, and the Contractor will be held responsible for the specified quality and gradation of stone boulder materials delivered to the site. All stone boulder materials not meeting the requirements of these Specifications as determined by weight tests and/or inspections at the quarries and site, will be rejected and any rejected material at the site shall be disposed of in an approved manner at the expense of and by the Contractor.

2.1.1.2 Quality

Stone or rock fragments of the quality and gradations specified herein shall be furnished by the Contractor. Asphalt, broken concrete, concrete slabs, or other materials not classified as rock will not be allowed for use as stone boulder material. No shale and/or organic materials shall be allowed for use as stone boulder material. Furthermore, no one rock shall have a dimension more than three times the least dimension of any one stone boulder, including sample stone boulders for acceptance testing.

All grouted stone boulder materials shall be durable quarried rock as approved by the Contracting Officer's Representative. Individual boulders in-place shall be free from cracks, seams, and other defects that will cause rapid or excessive deterioration or degradation during service. The Contractor shall select the source or sources he proposes to use and perform the initial sampling and testing of the materials well in advance of the time when the material will be required in the work.

2.1.1.3 Dimensions

The breadth (B), thickness (T), and length (L) of any piece of stone boulder shall not be less than the dimensions specified below. These axes or planes for the boulders are described as follows:

L - Longitudinal axis. Represents the center line (axis) connecting the most distant points (faces, noses, or apices) of the boulder.

B - Represents the center line within the stone boulder that intersects the L-axis at right angles.

T - Represents the center line within the rock that is perpendicular to the L-B planes.

Additionally, no one boulder shall have a dimension more than three times the least dimension of the stone boulder.

Boulders for use in construction of trickle channel sidewalls shall provide a cross section of approximately 3'-0"x 3'-0" (LxB or BxT); the third dimension of the boulder may vary at Contractor's discretion, but shall be not less than 1'-0" nor more than 9'-0". It is intended that the general shape of boulders for use in trickle channel sidewall construction be angular and blocky (e.g., roughly rectangular in cross section and profile).

Boulders for use in Grouted Stone Drop structures shall provide at least one dimension (L) of approximately 3'-6". It is intended that the boulders present a generally rounded appearance for that portion of the boulder extending above the surface of the grout. At Contractor's option, boulders for use in Grouted Stone Drop structures may consist of naturally occurring boulders selected for dimension and general shape, meeting the minimum stone quality requirements specified above.

2.1.2 Fiber Reinforced Grout Material

All product and material information for fiber-reinforced grout is covered in specification section \=03301=\, CAST-IN-PLACE STRUCTURAL CONCRETE.

2.1.3 Bedding

All product and material information for bedding material is covered in specification section \=02240=\, STONE (RIPRAP) PROTECTION.

2.1.4 Drain Blanket

All product and material information for drain blanket material is covered in specification section \=02222=\, EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS, and specification section \=02210=\, GRADING.

2.1.5 Metal Sheet Piling Cutoffs

Material and installation shall conform to the requirements of Section 02411, Metal Sheet Piling. Piling shape shall be of the Z type, providing a minimum section modulus of 10.4 in^3 per foot of width, and a minimum weight of 15.3 pounds per square foot of wall. At Contractor's option, and to the extent available, steel sheet piling used in construction of temporary excavation support in the vicinity of sta. 50+00 and sta. 57+10 may be salvaged and reused in the Grouted Stone Drop structures. The Contracting Officer may reject any individual pile which in his judgment has been damaged from previous installation and pulling operations to the extent that adequate interlock and pile shape has been compromised.

PART 3 EXECUTION

3.1 GENERAL

Quarry operations shall be controlled to produce reasonably well-graded stone boulders of required size, and the Contracting Officer may require changes as necessary to produce the required product. The Contractor's operations shall be conducted in a manner that will produce stone meeting the requirements specified and shall include selective quarrying, handling, and loading as required.

3.1.1 Grouted Stone Drop Structures

Bedding composed of the specified bedding material (and drain blanket where indicated) shall be placed on the prepared subgrade where indicated on the drawings to form a backing for the grouted stone boulder protection. Grouted stone boulder placement shall follow placement of bedding and drain blanket material.

3.2 PLACEMENT

3.2.1 Bedding

Bedding material under grouted stone boulder protection material shall be spread as indicated on the drawings and in specification section \=02240=\, STONE (RIPRAP) PROTECTION.

3.2.2 Drain Blanket

Drainage blanket materials shall be placed within the grouted stone boulder blankets as indicated on the drawings and in specification section \=02222=\, EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS, and specification section \=02210=\, GRADING.

3.2.3 Metal Sheet Piling Cutoffs

Metal sheet piling cutoff walls shall be placed within the grouted stone boulder blankets as indicated on the drawings and in specification section \=02411=\, METAL SHEET PILING.

3.2.4 Stone Boulders

The stone boulders shall be placed with a flat surface of the boulder positioned horizontally at the top. The stone boulders shall be placed with a minimum of gaps, so that each boulder is as close as practical to adjacent boulders. Boulders shall be individually placed in a manner to avoid displacing underlying materials or placing undue impact force on underlying materials. Each stone shall be placed to essentially the final position by the use of a multi-prong grapple devise or suitable equipment for handling materials and, if necessary, the stone shall be picked up and repositioned. Dragline buckets and skips shall not be used for placement of stone boulders. Moving stone by drifting or manipulation down a slope will also not be permitted. Boulders shall not be dropped from a height of greater than 1.0 foot. It should be anticipated by the Contractor that rehandling of individual stone boulders after initial placement will be required to achieve required slopes, grades, elevations, and position. The Contracting Officer’s Representative shall observe all stone boulder placement and approve of the placement before grout is placed.

After stone boulder placement is approved, fiber-reinforced grout shall be poured between the stone boulders (see paragraph 3.2.6, below). The stone boulders shall be clean and damp before concrete grout is poured against them. Grout shall fill all gaps between stone boulders as shown on the drawings. The tops of the stone boulders shall not be covered by grout. After grout placement, exposed surfaces of the stone boulders shall be thoroughly cleaned to remove all concrete

laitance. Any stone boulders displaced during the backfilling operation shall be replaced and regrouted in position at the Contractor's expense.

3.2.4.1 Grout Setting Bed for Boulders in Trickle Channel Sidewalls

Prior to setting boulders for trickle channel sidewalls, a setting bed of 4" of fiber reinforced grout shall be applied to the grouted stone boulder foundation. The boulders shall be positioned while the grout is still fluid; additional grout packing of the boulder setting bed will not be required.

3.2.5 Form Perimeter of Grouted Stone Boulders

Where shown on the drawings, the edge of the grouted stone boulder construction shall be formed to full height.

3.2.6 Fiber-Reinforced Grout

3.2.6.1 General

Before placement of grout, the stone boulders shall be thoroughly moistened and any excess of fines shall be sluiced to the underside of the stone boulder blanket before grouting.

Grout shall be delivered to the place of final deposit by a low-pressure grout pump, with a pressure of less than 10 psi using a 2-inch diameter nozzle. A concrete pump truck system will also be acceptable provided the pump pressure can be altered to provide the necessary slow delivery amounts. Penetration of the grout around the stone boulders shall be required using a pencil vibrator. The top surface of the stone boulder layer shall be left exposed above the grout surface as shown on the drawings. After placement, all exposed stone boulders with grout splashed on the surface shall be cleaned with a wet broom. All grout between stone boulders shall be finished with a broom finish to result in the finished grout line 3 inches below the top of adjacent stone boulders. Any holes or voids evident after vibrating or brooming shall be filled with additional grout material. All grout shall be sprayed with a clear liquid membrane curing compound as specified in ASTM C 309. If stone boulders cannot be cleaned of excess concrete, a solution of muriatic acid will be used to clean stone boulders.

3.2.6.2 Cold Weather Grout Placement

When depositing grout material when the mean daily temperatures are below 40 degrees F, follow recommendations of ACI 306. Maintain grout temperature at a minimum of 55 degrees F for sections having a thickness of less than 12 inches or a minimum of 50 degrees F for sections having a thickness of 12 inches or greater, for not less than 72 hours after depositing the grout material. Do not place grout without approval of the Contracting Officer's Representative on days when the temperature at 9:00 a.m. is below 30 degrees F. No grout is to be placed on snow, ice, frozen material, unsuitable ground conditions, or water.

3.2.6.3 Hot Weather Grout Placement

When depositing grout material in hot weather, follow recommendations of ACI 305. The temperature of grout at time of placement shall not exceed 90 degrees F. Grout material shall be protected to prevent rapid drying. Finishing and curing shall start as soon as possible. When the air temperature is expected to rise above 90 degrees F, the Contractor shall obtain approval from the Contracting Officer's Representative of the procedures to be used in protecting, depositing, finishing, and curing the grout. The specified water reducing and retarding admixture may be used upon approval of the Contracting Officer's Representative.

The use of continuous wetting or fog sprays may be required by the Contracting Officer's Representative for 24 hours after depositing the grout material or the work may be restricted to evenings or nights, especially in times of low humidity.

3.3 PROTECTION

The Contractor shall maintain the grouted stone boulder construction until accepted and any material displaced by any cause shall be replaced at his expense to the lines and grades shown on the drawings.

SECTION 02373

GEOTEXTILE
06/01

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4354 (1999) Sampling of Geosynthetics for Testing

ASTM D 4355 (1999) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

ASTM D 4491 (1999a) Water Permeability of Geotextiles by Permittivity

ASTM D 4533 (1991; R 1996) Trapezoid Tearing Strength of Geotextiles

ASTM D 4632 (1991; R 1997) Grab Breaking Load and Elongation of Geotextiles

ASTM D 4751 (1999a) Determining Apparent Opening Size of a Geotextile

ASTM D 4759 (2000) Determining the Specification Conformance of Geosynthetics

ASTM D 4833 (1988; R 1996el) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D 4873 (2001) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

1.2 MEASUREMENT

Not Used.

1.3 PAYMENT

Not Used.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, the letters following the "G" designation identify the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330, SUBMITTAL PROCEDURES:

SD-03 Product Data

Manufacturing Quality Control Manual Sampling and Testing; G-ED

A minimum of 7 days prior to scheduled use, manufacturer's quality control manual.

SD-04 Samples

Contractor shall submit one sample a minimum of 12 inches by 12 inches for archive purposes.

SD-07 Certificates

Geotextile; G-ED

A minimum of 7 days prior to scheduled use, manufacturer's certificate of compliance stating that the geotextile meets the requirements of this section. For needle punched geotextiles, the manufacturer shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

Delivery, storage, and handling of geotextile shall be in accordance with ASTM D 4873.

1.5.1 Delivery

The Contracting Officer shall be notified a minimum of 24 hours prior to delivery and unloading of geotextile rolls. Rolls shall be packaged in an opaque, waterproof, protective plastic wrapping. The plastic wrapping shall not be removed until deployment. If quality assurance samples are collected, rolls shall be immediately rewrapped with the plastic wrapping. Geotextile or plastic wrapping damaged during storage or handling shall be repaired or replaced, as directed. Each roll shall be labeled with the manufacturer's name, geotextile type, roll number, roll dimensions (length, width, gross weight), and date manufactured.

1.5.2 Storage

Rolls of geotextile shall be protected from construction equipment, chemicals, sparks and flames, temperatures in excess of 160 degrees F, or any other environmental condition that may damage the physical properties of the geotextile. To protect geotextile from becoming saturated, rolls shall either be elevated off the ground or placed on a sacrificial sheet of plastic in an area where water will not accumulate.

1.5.3 Handling

Geotextile rolls shall be handled and unloaded with load carrying straps, a fork lift with a stinger bar, or an axial bar assembly. Rolls shall not be dragged along the ground, lifted by one end, or dropped to the ground.

PART 2 PRODUCTS

2.1 RAW MATERIALS

2.1.1 Geotextile

Geotextile shall be a nonwoven pervious sheet of polymeric material and shall consist of long-chain synthetic polymers composed of at least 95 percent by

weight polyolefins, polyesters, or polyamides. The use of woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character) will not be allowed. Stabilizers and/or inhibitors shall be added to the base polymer, as needed, to make the filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure. Regrind material, which consists of edge trimmings and other scraps that have never reached the consumer, may be used to produce the geotextile. Post-consumer recycled material shall not be used. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Geotextiles shall meet the requirements specified in Table 1. Where applicable, Table 1 property values represent minimum average roll values (MARV) in the weakest principal direction. Values for AOS represent maximum average roll values.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

Property	Units	Acceptable Values	Test Method
GRAB STRENGTH	LBS	190	ASTM D 4632
SEAM STRENGTH	LBS	Not Applicable	ASTM D 4632
PUNCTURE	LBS	125	ASTM D 4833
TRAPEZOID TEAR	LBS	80	ASTM D 4533
APPARENT OPENING SIZE	U.S. SIEVE	70	ASTM D 4751
PERMITTIVITY	SEC -1	1.0	ASTM D 4491
ULTRAVIOLET DEGRADATION	PERCENT	50 AT 500 HRS	ASTM D 4355

2.1.2 Thread

Not Used.

2.2 MANUFACTURING QUALITY CONTROL SAMPLING AND TESTING

The Manufacturer shall be responsible for establishing and maintaining a quality control program to assure compliance with requirements of the specification. Documentation describing the quality control program shall be made available upon request. Manufacturing quality control sampling and testing shall be performed in accordance with the manufacturer's approved quality control manual. As a minimum, geotextiles shall be randomly sampled for testing in accordance with ASTM D 4354, Procedure A. Acceptance of geotextile shall be in accordance with ASTM D 4759. Tests not meeting the specified requirements shall result in the rejection of applicable rolls.

PART 3 EXECUTION

3.1 QUALITY ASSURANCE SAMPLES AND TESTS

Not Used.

3.1.1 Quality Assurance Samples

Not Used.

3.1.2 Quality Assurance Tests

Not Used.

3.2 INSTALLATION

3.2.1 Subgrade Preparation

The surface underlying the geotextile shall be smooth and free of ruts or protrusions which could damage the geotextile. Subgrade materials and compaction requirements shall be in accordance with specification section \=02210=\, GRADING.

3.2.2 Placement

The Contractor shall notify the Contracting Officer a minimum of 24 hours prior to installation of geotextile. Geotextile rolls which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. On slopes steeper than 10 horizontal on 1 vertical, the geotextile shall be laid with the machine direction of the fabric parallel to the slope direction.

3.3 SEAMS

3.3.1 Overlap Seams

Geotextile panels shall be continuously overlapped a minimum of 12 inches at all longitudinal and transverse joints. Where seams must be oriented across the slope, the upper panel shall be lapped over the lower panel. If approved, sewn seams may be used instead of overlapped seams.

3.4 PROTECTION

The geotextile shall be protected during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Adequate ballast (e.g. sand bags) shall be used to prevent uplift by wind. The geotextile shall not be left uncovered for more than 14 days after installation.

3.5 REPAIRS

Torn or damaged geotextile shall be repaired. Clogged areas of geotextile

shall be removed. Repairs shall be performed by placing a patch of the same type of geotextile over the damaged area. The patch shall extend a minimum of 12 inches beyond the edge of the damaged area. Patches shall be continuously fastened using approved methods. The machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Geotextile rolls which cannot be repaired shall be removed and replaced. Repairs shall be performed at no additional cost to the Government

3.6 PENETRATIONS

Engineered penetrations of the geotextile shall be constructed by methods recommended by the geotextile manufacturer.

3.7 COVERING

Geotextile shall not be covered prior to inspection and approval by the Contracting Officer. Cover soil shall be placed in a manner that prevents soil from entering the geotextile overlap zone, prevents tensile stress from being mobilized in the geotextile, and prevents wrinkles from folding over onto themselves. On side slopes, soil backfill shall be placed from the bottom of the slope upward. Cover soil shall not be dropped onto the geotextile from a height greater than 3 feet. Riprap shall not be dropped onto the geotextile from a height greater than 1 foot. No equipment shall be operated directly on top of the geotextile without approval of the Contracting Officer. Equipment with ground pressures less than 7 psi shall be used to place the first lift over the geotextile. A minimum of 12 inches of soil shall be maintained between full-scale construction equipment and the geotextile. Cover soil material type, compaction, and testing requirements are described in specification section \=02210=\, GRADING. Equipment placing cover soil shall not stop abruptly, make sharp turns, spin their wheels, or travel at speeds exceeding 5 mph.

SECTION 02440

TRAFFIC SIGNS
03/97

PART 1 GENERAL

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

STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO [CDOH] - STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1999 EDITION.

CDOH	Section 614	Traffic Control Devices
CDOH	Section 713	Traffic Control Materials

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM A 36-\	(2000) Carbon Structural Steel
\-ASTM A 123-\	(2001) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
\-ASTM B 209-\	(2001) Aluminum and Aluminum-Alloy Sheet and Plate
\-ASTM D 4956-\	(2001) Retroreflective Sheeting for Traffic Control

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARD

\-MUTCD-\ (2000) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS (NOT USED)

1.3 GENERAL
All sign faces shall conform to \-MUTCD-\.

PART 2 PRODUCTS

2.1 SIGN POSTS

2.1.1 Steel Flanged Channel Section (U-Shape)
Steel posts shall be fabricated from steel conforming to \-ASTM A 36-\ and shall have a minimum yield strength of 30 ksi and a minimum tensile strength of 50 ksi. Steel posts shall have 5/16 to 3/8 inch diameter holes spaced at 1 or 2 inch centers punched or drilled along the centerline of the web prior to galvanizing for the entire length of the post. Posts shall be galvanized in accordance with \-ASTM A 123-\.

2.2 ALUMINUM SIGN PANELS
Aluminum sign panels shall conform to \-ASTM B 209-\, alloy no.-temper 6061-T6 or 5052-H38. The blanks shall be free from laminations, blisters, open seams, pits, holes, other defects that may affect their appearance or use. The thickness shall be uniform and the blank commercially flat.

2.3 RETROREFLECTIVE SHEETING

Retroreflective sheeting shall conform to \-ASTM D 4956-\, Type I, II, III, IV, V, or VI. Type I retroreflective sheeting shall conform to \-ASTM D 4956-\, except the minimum coefficients of retroreflection for brown type I sheeti 2.0 cd/fc/ft^2 at ng shown in Table I of \-ASTM D 4956-\ are ammended as follows: 0.2 degrees observation angle and -4 degrees entrance angle, 1.0 cd/fc/ft^2 at 0.2 degrees observation angle and +30 degrees entrance angle and at 0.5 degrees observation angle and -4 degrees entrance angle, and 0.5 cd/fc/ft^2 at 0.5 degrees observation angle and +30 degrees entrance angle. All retroreflective sheeting shall have a precoated adhesive which will permanently adhere to the sign panel surface.

2.4 HARDWARE

Bolts, nuts and metal washers shall be either aluminum alloy or commercial quality steel, hot-dip galvanized or cadmium plated after fabrication. Fiber washers shall be of commercial quality.

PART 3 EXECUTION

3.1 GENERAL

Insulating material shall be placed to prevent contact between aluminum and steel material.

3.2 SIGN POSTS

Steel sign posts shall either be driven with a suitable driving head or set in drilled or punched holes. Any posts damaged during driving or otherwise shall be replaced at no additional cost to the Government.

3.3 SIGN PANELS

Clean, degrease and etch the face of metal panels using methods recommended by the retroreflective sheeting manufacturer. After cleaning and degreasing, retroreflective sheeting material shall be applied to the sign panels as recommended by the manufacturer. Shearing, cutting and punching shall be performed prior to preparing the blanks for application of reflective material. Holes shall not be field drilled in any part of the panel. The back side of all sign panels shall be stamped with the month and year that the sign was manufactured. The date shall be located on the lower right side of the back of the sign panel and shall be approximately 1/4 inch high. The date shall be stamped into the sign panel material for a permanent record. Any damaged sign panels shall be replaced at no additional cost to the Government.

3.4 LETTERS, NUMERALS, ARROWS, SYMBOLS, AND BORDERS

Letters, numerals, arrows, symbols, and borders shall be applied on the retroreflective sheeting or opaque background of the sign using the direct or reverse screen process. Messages and borders of a color darker than the background shall be applied to the paint or the retroreflective sheeting using the direct process. Messages and borders shall be of a color lighter than the sign background and shall be applied using the reverse screen process. Opaque or transparent colors, inks, and paints of the type and quality recommended by the retroreflective sheeting manufacturer shall be used in the screen process. The screening shall be performed in a manner that results in a uniform color and tone, with sharply defined edges of legends and borders and without blemishes on the sign background that will affect intended use. The signs shall be air dryed or baked after screening according to the manufacturer's recommendations to provide a smooth hard finish. Any signs with blister's or other blemishes shall be rejected.

3.5 LOCATION AND POSITION OF SIGNS

All signs shall be located and erected in accordance with the drawings and \-MUTCD-\. Unless otherwise shown, signs shall be erected with the sign faces

and posts vertical. To reduce specular glare (mirror reflection), sign panels shall be turned 3 degrees away from the road in the direction of travel. The Contracting Officer's Representative shall inspect all signs for specular reflection at night after installation has been completed. If specular reflection is apparent on any sign, it shall be adjusted by the Contractor at his expense to eliminate or minimize specular reflection to the satisfaction of the Contracting Officer's Representative.

SECTION 02511

CONCRETE SIDEWALKS AND CURBS AND GUTTERS
01/89

PART 1 GENERAL

1.1 REFERENCES

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

COLORADO DEPARTMENT OF TRANSPORTATION [CDOT] - STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1999 EDITION.

CDOT	Section 608	Sidewalks & Bikeways
CDOT	Section 609	Curb & Gutter

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

\-AASHTO M 182-\	(1991) Burlap Cloth Made from Jute or Kenaf

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM A 185-\	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
\-ASTM A 615-\	(1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
\-ASTM C 31-\	(1996) Making and Curing Concrete Test Specimens in the Field
\-ASTM C 143-\	(1990a) Slump of Hydraulic Cement Concrete
\-ASTM C 171-\	(1997) Sheet Materials for Curing Concrete
\-ASTM C 172-\	(1997) Sampling Freshly Mixed Concrete
\-ASTM C 173-\	(1996) Air Content of Freshly Mixed Concrete by the Volumetric Method
\-ASTM C 231-\	(1997) Air Content of Freshly Mixed Concrete by the Pressure Method
\-ASTM C 309-\	(1997) Liquid Membrane-Forming Compounds for Curing Concrete
\-ASTM D 1751-\	(1983; R 1991) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
\-ASTM D 1752-\	(1984; R 1996) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

CORPS OF ENGINEERS (COE)

\-COE CRD-C 527-\	(1988) Standard Specification for Joint Sealants, Cold-Applied, Non-Jet-Fuel-Resistant, for Rigid and Flexible Pavements

1.2 NOT USED

1.3 NOT USED

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the "G" designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-06 Test Reports

Field Quality Control.

Copies of all test reports within 24 hours of completion of the test.

Concrete.

Copies of certified delivery tickets for all concrete used in the construction.

1.5 WEATHER LIMITATIONS

1.5.1 Placing During Cold Weather

Concrete placement shall be discontinued when the air temperature reaches 40 degrees F and is falling. Placement may begin when the air temperature reaches 35 degrees F and is rising. Provisions shall be made to protect the concrete from freezing during the specified curing period. If necessary to place concrete when the temperature of the air, aggregates, or water is below 35 degrees F, placement shall be approved in writing. Approval shall be contingent upon full conformance with the following provisions. The underlying material shall be prepared and protected so that it is entirely free of frost when the concrete is deposited. Mixing water and aggregates shall be heated as necessary to result in the temperature of the in-place concrete being between 50 and 85 degrees F. Methods and equipment for heating shall be approved. The aggregates shall be free of ice, snow, and frozen lumps before entering the mixer. Covering and other means shall be provided for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing, and at a temperature above freezing for the remainder of the curing period.

1.5.2 Placing During Warm Weather

The temperature of the concrete as placed shall not exceed 85 degrees F except where an approved retarder is used. The mixing water and/or aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. In no case shall the placing temperature exceed 95 degrees F.

1.6 PLANT, EQUIPMENT, MACHINES, AND TOOLS

1.6.1 General Requirements

Plant, equipment, machines, and tools used in the work shall be subject to approval and shall be maintained in a satisfactory working condition at all

times. The equipment shall have the capability of producing the required product, meeting grade controls, thickness control and smoothness requirements as specified. Use of the equipment shall be discontinued if it produces unsatisfactory results. The Contracting Officer shall have access at all times to the plant and equipment to ensure proper operation and compliance with specifications.

1.6.2 Slip Form Equipment
Slip form paver or curb forming machine, will be approved based on trial use on the job and shall be self-propelled, automatically controlled, crawler mounted, and capable of spreading, consolidating, and shaping the plastic concrete to the desired cross section in one pass.

PART 2 PRODUCTS

2.1 CONCRETE
Concrete shall conform to the applicable requirements of Section \=03301=\ CAST-IN-PLACE STRUCTURAL CONCRETE except as otherwise specified. Concrete shall have a minimum compressive strength of 4,000 psi at 28 days. Maximum size of aggregate shall be 1-1/2 inches.

2.1.1 Air Content
Mixtures shall have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer.

2.1.2 Slump
The concrete slump shall be 2 inches +/-1 inch where determined in accordance with \-ASTM C 143-\.

2.1.3 Reinforcement Steel
Reinforcement bars shall conform to \-ASTM A 615-\. Wire mesh reinforcement shall conform to \-ASTM A 185-\.

2.2 CONCRETE CURING MATERIALS

2.2.1 Impervious Sheet Materials

Impervious sheet materials shall conform to \-ASTM C 171-\, type optional, except that polyethylene film, if used, shall be white opaque.

2.2.2 Burlap
Burlap shall conform to\-AASHTO M 182-\.

2.2.3 White Pigmented Membrane-Forming Curing Compound
White pigmented membrane-forming curing compound shall conform to \-ASTM C 309-\, Type 2.

2.3 CONCRETE PROTECTION MATERIALS
Concrete protection materials shall be a linseed oil mixture of equal parts, by volume, of linseed oil and either mineral spirits, naphtha, or turpentine. At the option of the contractor, commercially prepared linseed oil mixtures, formulated specifically for application to concrete to provide protection against the action of deicing chemicals may be used, except that emulsified mixtures are not acceptable.

2.4 JOINT FILLER STRIPS

2.4.1 Contraction Joint Filler for Curb and Gutter

Contraction joint filler for curb and gutter shall consist of hard-pressed fiberboard.

2.4.2 Expansion Joint Filler, Premolded
Expansion joint filler, premolded, shall conform to \-ASTM D 1751-\ or \-ASTM D 1752-\, 3/8 inch thick, unless otherwise indicated.

2.5 JOINT SEALANTS

2.5.1 Joint Sealant, Cold-Applied
Joint sealant, cold-applied shall conform to \-COE CRD-C 527-\.

2.5.2 Not Used

2.6 FORM WORK

Form work shall be designed and constructed to insure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete. Wood forms shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Wood forms shall have a nominal length of 10 feet. Radius bends may be formed with 3/4-inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Ends of steel forms shall be interlocking and self-aligning. Steel forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Steel forms shall have a nominal length of 10 feet with a minimum of two welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips designed for use with steel forms.

2.6.1 Sidewalk Forms
Sidewalk forms shall be of a height equal to the full depth of the finished sidewalk.

2.6.2 Curb and Gutter Forms
Curb and gutter outside forms shall have a height equal to the full depth of the curb or gutter. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form. Rigid forms shall be provided for curb returns, except that benders or thin plank forms may be used for curb or curb returns with a radius of 10 feet or more, where grade changes occur in the return, or where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms for curb returns may be made of 1-1/2 inch benders, for the full height of the curb, cleated together.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION
The subgrade shall be constructed to the specified grade and cross section prior to concrete placement. Subgrade shall be placed and compacted to conform with applicable requirements of Section \=02210=\GRADING.

3.1.1 Sidewalk Subgrade
The subgrade shall be tested for grade and cross section with a template extending the full width of the sidewalk and supported between side forms.

3.1.2 Curb and Gutter Subgrade

The subgrade shall be tested for grade and cross section by means of a template extending the full width of the curb and gutter. The subgrade shall be of materials equal in bearing quality to the subgrade under the adjacent pavement.

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

3.2 FORM SETTING

Forms shall be carefully set to the indicated alignment, grade and dimensions. Forms shall be held rigidly in place by a minimum of three stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

3.2.1 Sidewalks
Forms for sidewalks shall be set with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10-foot long section. After forms are set, grade and alignment shall be checked with a 10-foot straightedge. Forms shall have a transverse slope as indicated or, where not indicated, of 1/4-inch per foot with the low side adjacent to the roadway. Side forms shall not be removed for 12 hours after finishing has been completed.

3.2.2 Curbs and Gutters
The forms of the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms back of curb shall remain in place until the face and top of the curb have been finished as specified for concrete finishing. Gutter forms shall not be removed while the concrete is sufficiently plastic to slump in any direction.

3.3 SIDEWALK CONCRETE PLACEMENT AND FINISHING

3.3.1 Formed Sidewalks
Concrete shall be placed in the forms in one layer of such thickness that when consolidated and finished the sidewalks will be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be consolidated with an approved vibrator, and the surface shall be finished to grade with a wood float, bull float, or darby, edged and broom finished.

3.3.2 Concrete Finishing
After straightedging, when most of the water sheen has disappeared, and just before the concrete hardens, the surface shall be finished to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic.

3.3.3 Edge and Joint Finishing

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

3.3.4 \+Surface and Thickness Tolerances+
Finished surfaces shall not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.4 CURB AND GUTTER CONCRETE PLACEMENT AND FINISHING

3.4.1 Formed Curb and Gutter

Concrete shall be placed to the section required in a single lift. Consolidation shall be achieved by using approved mechanical vibrators.

3.4.2 Concrete Finishing
Exposed surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with a fine-hair brush with longitudinal strokes. The edges of the gutter and top of the curb shall be rounded with an edging tool to a radius of 1/2 inch. Immediately after removing the front curb form, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The front curb surface, while still wet, shall be brushed in the same manner as the gutter and curb top. The top surface of gutter and entrance shall be finished to grade with a wood float.

3.4.3 Joint Finishing
Curb edges at formed joints shall be finished as indicated.

3.4.4 \+Surface and Thickness Tolerances+
Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.5 SIDEWALK JOINTS
Sidewalk joints shall be constructed to divide the surface into rectangular areas. Transverse contraction joints shall be spaced at a distance equal to the sidewalk width or 5 feet on centers, whichever is less, and shall be continuous across the slab. Longitudinal contraction joints shall be constructed along the centerline of all sidewalks 10 feet or more in width. Transverse expansion joints shall be installed at sidewalk returns and opposite expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints shall be installed as indicated. Expansion joints shall be formed about structures and features which project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated.

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

3.5.2 Expansion Joints

Expansion joints shall be formed with 1/2 inch joint filler strips. Joint filler shall be placed with top edge 1/4 inch below the surface and shall be held in place with steel pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/8 inch, and concrete over the joint filler shall be removed. At the end of the curing period, expansion joints shall be carefully cleaned and filled with joint sealer.

The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing shall be done so that the material will not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above \50 degrees F at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

3.6 CURB AND GUTTER JOINTS

Curb and gutter joints shall be constructed at right angles to the line of curb and gutter.

3.6.1 Contraction Joints

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

3.6.2 Expansion Joints

Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints shall be provided in curb and gutter directly opposite expansion joints of abutting portland cement concrete pavement, and shall be of the same type and thickness as joints in the pavement. Where curb and gutter do not abut portland cement concrete pavement, expansion joints at least 1/2 inch~\ in width shall be provided at intervals not exceeding 120 feet. Expansion joints shall be provided in nonreinforced concrete gutter at locations indicated. Expansion joints shall be sealed immediately following curing of the concrete or as soon thereafter as weather conditions permit. Expansion joints and the top 1-inch depth of curb and gutter contraction-joints shall be sealed with joint sealer. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing shall be done so that the material will not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

3.7 CURING AND PROTECTION

3.7.1 General Requirements

Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Unhardened concrete shall be protected from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready for use before actual concrete placement begins. Protection shall

be provided as necessary to prevent cracking of the pavement due to temperature changes during the curing period.

3.7.1.1 Mat Method

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

3.7.1.2 Impervious Sheeting Method

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

3.7.1.3 Membrane Curing Method

A uniform coating of white-pigmented membrane-curing compound shall be applied to the entire exposed surface of the concrete as soon after finishing as the free water has disappeared from the finished surface. Formed surfaces shall be coated immediately after the forms are removed and in no case longer than 1 hour after the removal of forms. Concrete shall not be allowed to dry before the application of the membrane. If any drying has occurred, the surface of the concrete shall be moistened with a fine spray of water and the curing compound applied as soon as the free water disappears. Curing compound shall be applied in two coats by hand-operated pressure sprayers at a coverage of approximately 200 square feet per gallon for both coats. The second coat shall be applied in a direction approximately at right angles to the direction of application of the first coat. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. If pinholes, abrasion, or other discontinuities exist, an additional coat shall be applied to the affected areas within 30 minutes. Concrete surfaces that are subjected to heavy rainfall within 3 hours after the curing compound has been applied shall be resprayed by the method and at the coverage specified above. Areas where the curing compound is damaged by subsequent construction operations within the curing period shall be resprayed. Necessary precautions shall be taken to insure that the concrete is properly cured at sawed joints, and that no curing compound enters the joints. The top of the joint opening and the joint groove at exposed edges shall be tightly sealed before the concrete in the region of the joint is resprayed with curing compound. The method used for sealing the joint groove shall prevent loss of moisture from the joint during the entire specified curing period. Approved standby facilities for curing concrete pavement shall be provided at a location accessible to the jobsite for use in the event of mechanical failure of the spraying equipment or other conditions that might prevent correct application of the membrane-curing compound at the proper time. Concrete surfaces to which membrane-curing compounds have been applied shall be adequately protected during the entire curing period from pedestrian and vehicular traffic, except as required for joint-sawing operations and surface tests, and from any other possible damage to the continuity of the membrane.

3.7.2 Backfilling

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

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

3.8 *FIELD QUALITY CONTROL*

3.8.1 General Requirements
The Contractor shall perform the inspection and tests described and meet the specified requirements for inspection details and frequency of testing. Based upon the results of these inspections and tests, the Contractor shall take the action and submit reports as required below, and any additional tests to insure that the requirements of these specifications are met.

3.8.2 Concrete Testing

3.8.2.1 \+Strength Testing+
The Contractor shall provide molded concrete specimens for strength tests. Samples of concrete placed each day shall be taken not less than once a day nor less than once for every 250 cubic yards of concrete. The samples for strength tests shall be taken in accordance with \-ASTM C 172-\. Cylinders for acceptance shall be molded in conformance with \-ASTM C 31-\ by an approved testing laboratory. Each strength test result shall be the average of two test cylinders from the same concrete sample tested at 28 days, unless otherwise specified or approved. Concrete specified on the basis of compressive strength will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength, and no individual strength test result falls below the specified strength by more than 500 psi.

3.8.2.2 \+Air Content+

Air content shall be determined in accordance with \-ASTM C 173-\ or \-ASTM C 231-\. \-ASTM C 231-\ shall be used with concretes and mortars made with relatively dense natural aggregates. Two tests for air content shall be made on randomly selected batches of each class of concrete placed during each shift. Additional tests shall be made when excessive variation in concrete workability is reported by the placing foreman or the Government inspector. If results are out of tolerance, the placing foreman shall be notified and he shall take appropriate action to have the air content corrected at the plant. Additional tests for air content will be performed on each truckload of material until such time as the air content is within the tolerance specified.

3.8.2.3 \+Slump Test+
Two slump tests shall be made on randomly selected batches of each class of concrete for every 250 cubic yards, or fraction thereof, of concrete placed during each shift. Additional tests will be performed when excessive variation in the workability of the concrete is noted or when excessive crumbling or slumping is noticed along the edges of slip-formed concrete.

3.8.3 Thickness Evaluation
The anticipated thickness of the concrete shall be determined prior to placement by passing a template through the formed section or by measuring the depth of opening of the extrusion template of the curb forming machine. If a slip form paver is used for sidewalk placement, the subgrade shall be true to grade prior

to concrete placement and the thickness will be determined by measuring each edge of the completed slab.

3.8.4 Surface Evaluation
The finished surface of each category of the completed work shall be uniform in color and free of blemishes and form or tool marks.

3.9 SURFACE DEFICIENCIES AND CORRECTIONS

3.9.1 Thickness Deficiency
When measurements indicate that the completed concrete section is deficient in thickness by more than 1/4 inch the deficient section will be removed, between regularly scheduled joints, and replaced.

3.9.2 High Areas
In areas not meeting surface smoothness and plan grade requirements, high areas shall be reduced either by rubbing the freshly finished concrete with carborundum brick and water when the concrete is less than 36 hours old or by grinding the hardened concrete with an approved surface grinding machine after the concrete is 36 hours old or more. The area corrected by grinding the surface of the hardened concrete shall not exceed 5 percent of the area of any integral slab, and the depth of grinding shall not exceed 1/4 inch. All pavement areas requiring grade or surface smoothness corrections in excess of the limits specified above shall be removed and replaced.

3.9.3 Appearance
Exposed surfaces of the finished work will be inspected by the Government and any deficiencies in appearance will be identified. Areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the work shall be removed and replaced.

SECTION 02552

BASE COURSES, BITUMINOUS SURFACE COURSES, AND BITUMINOUS TACK AND PRIME COATS

PART 1. GENERAL

1.1. REFERENCES

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

STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO (CDOT)

Standard Specification for Road and Bridge Construction, 1999 Edition.

CDOT	Section 401	Plant Mix Pavements - General;
CDOT	Section 403	Hot Mix Bituminous Pavement
CDOT	Section 407	Prime Coat, Tack Coat, and Rejuvenating Agent
CDOT	Section 702	Bituminous Materials

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM C 88-\	(1990) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
\-ASTM C 127-\	(1988; R 1993) Specific Gravity and Absorption of Coarse Aggregate
\-ASTM C 128-\	(1997) Specific Gravity and Absorption of Fine Aggregate
\-ASTM D 1075-\	(1996) Effect of Water on Compressive Strength of Compacted Bituminous Mixtures
\-ASTM D 1557-\	(2000) Laboratory Compaction Characteristics of Soils Using Modified Effort (56,000 ft-lbf/ft (2,700 kN-m/m))
\-ASTM D 2041-\	(2000) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
\-ASTM D 2726-\	(2000) Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
\-ASTM D 2950-\	(1991; R1997) Density of Bituminous Concrete in Place by Nuclear Methods

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

\-AASHTO T 193-\	(1993) The California Bearing Ratio

1.2. SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Job Mix Formula; G-DO

SD-06 Test Reports
Moisture-Density Relationships; G-AO
Certified Refinery Analysis; G-AO
Bituminous Surface Course; G-AO
Aggregate; G-AO

1.3. PLANT, EQUIPMENT, MACHINES, AND TOOLS

1.3.1. General

The bituminous plant shall be of such capacity to produce the quantities of bituminous mixtures required. Hauling equipment, paving machines, rollers, miscellaneous equipment, and tools shall be provided in sufficient numbers and capacity and in proper working conditions to place the bituminous paving mixtures at a rate equal to the plant output.

1.3.2. Mixing Plants

The mixing plant shall be an automatic or semiautomatic controlled commercially manufactured unit designed and operated to consistently produce a mixture within the job-mix formula (JMF). The plant shall have a minimum capacity of 100 tons per hour. Drum mixers shall be prequalified at the production rate to be used during actual mix production. The prequalification tests shall include extraction and recovery of the asphalt cement in accordance with applicable CDOT requirements. The penetration of the recovered asphalt binder shall not be less than 60 percent of the original penetration.

1.3.3. Straightedge

The Contractor shall furnish and maintain at the site, in good condition, one 12-foot straightedge for each bituminous paver. A straightedge shall be made available for Government use and meeting the requirements herein. Straightedges shall be constructed of aluminum or other lightweight metal and shall have blades of box or box-girder cross section with flat bottom reinforced to ensure rigidity and accuracy. Straightedges shall have handles to facilitate movement on pavement.

1.4. WEATHER LIMITATIONS

Unless otherwise directed, bituminous courses shall not be constructed when the surface temperature of the existing pavement or base course is below 40 degrees F.

1.5. PROTECTION OF PAVEMENT

After final rolling, no vehicular traffic or any kind shall be permitted on the pavement until the pavement has cooled to 140 degrees F.

1.6. GRADE AND SURFACE SMOOTHNESS REQUIREMENTS

Finished surface of bituminous courses, when tested as specified below and in paragraph ACCEPTABILITY OF WORK, shall conform to grade lines and elevations as shown on the drawings and to surface-smoothness requirements specified.

1.6.1. Plan Grade

The grade of the completed surface shall not deviate more than 0.05 foot from the plan grade.

1.6.2. Surface Smoothness

When a 12-foot straightedge is laid on the surface parallel with the centerline of the paved area or transverse from crown to pavement edge, the surface shall vary not more than 1/4 inch from the straightedge.

1.7. GRADE CONTROL
Lines and grades shall be established and maintained by means of line and grade stakes placed at job site of work in accordance with the CONTRACT CLAUSES. Elevations of bench marks used by the Contractor for controlling pavement operations at the site of work shall be determined, established, and maintained by the Government. Finished pavement elevations shall be established and controlled at the site of work by the Contractor in accordance with the bench mark elevations furnished by the Contracting Officer.

PART 2. PRODUCTS (NOT APPLICABLE)

PART 3. EXECUTION

3.1. DEFINITION
Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedures presented in \-ASTM D 1557-\, "Procedure C" (Base Course Material Only). This will be abbreviated hereinafter as percent laboratory maximum density.

3.2. MODIFICATION TO THE CDOT
Reference to "Engineer" and "Department" in the CDOT shall mean the Contracting Officer or Representative.

3.3. MEASUREMENTS AND PAYMENT (NOT APPLICABLE)

3.4. PAVEMENT REMOVAL
Where pavement is to be removed at the locations shown on the drawings, the pavement shall be sawed with a pre-approved concrete saw so as to leave a straight true edge. The pavement material and existing base course shall be removed in a manner that shall not disturb the adjacent in-place material to remain and as shown on the drawings. Pavement material from the removal area shall be disposed of off Government controlled land at the Contractor's expense.

3.5. PAVEMENT REPLACEMENT
The replaced pavement materials shall consist of bituminous surface course and aggregate base course, placed on top of compacted subgrade, placed to the lines and grades of the existing pavement as shown on the drawings. Replacement pavement and new pavement materials shall conform to the following requirements listed in this section.

3.6. BITUMINOUS SURFACE AND INTERMEDIATE COURSES (CENTRAL PLANT HOT MIX)

3.6.1. Job Mix Formula
The proposed mix design, aggregate test results, and certified refinery analysis shall be submitted to the Contracting Officer 45 days before production of bituminous mixture commences. No bituminous mixture shall be produced until the job mix formula determined from the bituminous mix design has been approved by the MRD laboratory. The bituminous mix design shall be established in accordance with all applicable CDOT requirements.

Bituminous surface courses shall conform to and be placed to the requirements specified in the CDOT, Section 401 PLANT MIX PAVEMENTS-GENERAL, and Section 403 HOT BITUMINOUS PAVEMENT. The surface course grading shall be "S" or "SX". The intermediate course grading shall be "SG". All aggregate shall meet the CDOT as specified for each grading.

In addition to the CDOT aggregate requirements, the aggregate shall conform to the following:

a. The amount of natural fine aggregate in the entire blend of aggregates shall not exceed 20 percent.

Coarse aggregate shall meet the following additional requirements:

a. Percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with \-ASTM C 88-\, using magnesium sulfate.

3.6.2. Test Properties of Bituminous Mixtures

The bituminous surface and intermediate course mixtures shall meet all Marshall method design requirements currently being used by the CDOT. The bituminous mixtures shall be designed using a 50 blow compactive effort.

3.6.2.1. Stability, Flow and Voids

\-ASTM D 2041-\ shall be used in computing the voids total mix and voids filled with bitumen, and the mixture shall meet the following requirements:

TABLE I NON-ABSORPTIVE-AGGREGATE MIXTURE

	Surface Course	Intermediate Course
Stability minimum, pounds	1000	1000
Flow maximum, 1/100-inch units	20	20
Voids total mix, percent	3-5	4-6
Voids filled with bitumen, percent	70-80	65-75

TABLE II - ABSORPTIVE-AGGREGATE MIXTURE

	Surface Course	Intermediate Course
Stability minimum, pounds	1000	1000
Flow maximum, 1/100-inch units	20	20
Voids total mix, percent	2-4	3-5
Voids filled with bitumen, percent	80-90	70-80

a. When the water-absorption value of the entire blend of aggregate does not exceed 2.5 percent as determined in accordance with \-ASTM C 127-\ and \-ASTM C 128-\, the aggregate is designated as nonabsorptive. The theoretical specific gravity computed from the apparent specific gravity or \-ASTM D 2041-\ shall be used in computing voids total mix and voids filled with bitumen. The mixture shall meet the requirements in TABLE I.

b. When the water-absorption value of the entire blend of aggregate exceeds 2.5 percent as determined in accordance with \-ASTM C 127-\ and \-ASTM C 128-\, the aggregate is designated as absorptive. The theoretical specific gravity computed from \-ASTM D 2041-\ shall be used in computing percentages of voids total mix and voids filled with bitumen. The mixture shall meet the requirements in TABLE II.

3.6.2.2. Reduction in Stability by Immersion

The index of retained stability must be 75 percent or greater when determined by \-ASTM D 1075-\. When the index of retained stability is less than 75, the aggregate stripping tendencies may be countered by the use of hydrated lime or by treating the bitumen with an approved antistripping agent. The hydrated lime is considered as mineral filler and should be considered in the gradation requirements. The amount of hydrated lime or antistripping agent added to bitumen shall be sufficient, as approved, to produce an index of retained stability of not less than 75 percent. No additional payment will be made to the Contractor for addition of antistripping agent required.

3.7. BITUMINOUS HOT MIX

Bituminous hot mix shall be comprised of coarse aggregate, fine aggregate, mineral filler (if required), bituminous material, and approved additives (if required), of the qualities and in the proportions specified herein and shall conform to the requirements contained in paragraphs PROPORTIONING OF MIXTURE and ACCEPTABILITY OF WORK.

3.7.1. Bituminous Material (Asphalt Cement)

Asphalt cement shall conform to, and be placed in accordance with, the requirements specified in the CDOT, Section 702 BITUMINOUS MATERIALS. The asphalt cement shall be penetration grade 85-100 or viscosity Grade AC-10. Approval of bituminous material shall be based on a certified refinery analysis submitted by the Contractor in accordance with Section SPECIAL CLAUSES, showing that the material conforms to the requirements of the CDOT.

3.7.2. Bituminous Prime Coat

Bituminous Prime Coat shall conform to and be placed to the requirements specified in the CDOT Section 407, PRIME COAT, TACK COAT, AND REJUVENATING AGENT, and Section 702 BITUMINOUS MATERIALS. Bituminous materials shall be liquid asphalt, designation MC-30, or MC-70 at the Contractor's option, except that only MC-30 shall be used on dense graded base courses if MC-70 does not adequately penetrate the base course material. In lieu of cut-back asphalt, the Contractor may use cationic emulsified asphalt, designation CSS-l or CSS-lh. Rate of application shall be not less than 0.15 gallons nor more than 0.40 gallons per square yard.

3.7.3. Bituminous Tack Coat

Bituminous tack coat shall conform to the requirements specified in the CDOT, Section 407 PRIME COAT, TACK COAT, AND REJUVENATING AGENT. Bituminous material shall be emulsified asphalt designation SS-1 or SS-1h, or cationic emulsified asphalt designation CSS-1 or CSS-1h. Rate of application shall be not less than 0.05 gallon nor more than 0.15 gallon per square yard.

3.8. AGGREGATE BASE COURSES

The aggregate base courses for bituminous pavement shall conform to, and be placed in accordance with, the requirements specified in Section 02241 CRUSHED AGGREGATE.

3.8.1. Crushed Aggregate Base Course

Crushed aggregate base course shall be Class 5. The aggregate shall meet the following additional properties; the aggregate shall be a crushed quarry rock, and shall have a minimum California Bearing Ratio (CBR) of 80. The CBR shall be determined in accordance with \-ASHTO T-193-\. The percentage of loss shall not exceed 18 after 5 cycles when performed in accordance with \-ASTM C 88-\, using magnesium sulfate. The liquid limit shall not exceed 25 and the plasticity index shall not exceed 5. When tested for gradation, the percentage passing the 200 sieve shall not exceed 10 percent and the 0.02 mm sieve shall not exceed 3.0 percent. The aggregate base course shall be compacted to 100 percent of laboratory maximum density. The laboratory maximum density shall be determined in accordance with \-ASTM D 1557-\, Procedure C.

3.9. OTHER MATERIALS

3.9.1. Mineral Filler
Mineral filler, if required, shall conform to all CDOT requirements.

3.9.2. Additives
Additives, such as antistripping and antifoaming agents, if required, shall conform to all CDOT requirements.

3.10. SUBGRADE
The subgrade for bituminous pavement shall conform to, and be placed in accordance with, the requirements specified in the CDOT, Section 306 RECONDITIONING. The subgrade shall be compacted to a minimum 95 percent of laboratory maximum density. The laboratory maximum density shall be determined in accordance with \-ASTM D 1557-\.

3.11. SAMPLING AND TESTING OF AGGREGATES AND BITUMINOUS MATERIALS
All quality control sampling, testing, and establishing of the bituminous mix design shall be the responsibility of the Contractor, shall be performed at no additional cost to the Government, and shall be performed in accordance with Section 1451 CONTRACTOR QUALITY CONTROL or as specified herein. Sampling and testing shall be performed by an approved testing laboratory at the expense of the Contractor and shall be in accordance with the CDOT or as specified herein. The Government may perform verification tests as considered necessary at its own expense. The Contractor shall submit for approval the bituminous job-mix formula plus laboratory tests, aggregate test results and moisture-density test results showing that the requirements specified herein and in the CDOT are satisfied. Initial acceptance samples or materials placed not meeting the CDOT requirements or as described herein shall be rejected or removed and replaced at the Contractor's expense and as directed by the Contracting Officer or Representative. Initial test results shall be submitted at least 20 working days prior commencing construction. Aggregates shall not be delivered to the job site or used in the production of bituminous mixtures without prior approval.

3.11.1. Initial Tests
All material proposed for use shall be tested by the Contractor prior to commencing construction to demonstrate that the proposed material shall meet all the CDOT specifications and/or as modified herein.

3.11.2. In-Place Tests
One of each of the following tests shall be performed on samples taken from the placed and compacted subgrade and base courses. Samples shall be taken for each 1000 square yards or less of each layer placed in each area.

a. Sieve Analysis (Base course only)
b. Field Density and Moisture

3.11.3. Aggregates

3.11.3.1. Coarse Aggregate
Coarse aggregate shall be tested in accordance with CDOT requirements.

3.11.3.2. Fine Aggregate
Fine aggregate shall be tested in accordance with CDOT requirements.

3.11.3.3. Mineral Filler
Mineral filler shall be tested in accordance with CDOT requirements.

3.11.3.4. Quality Control Tests
During production, aggregates shall be sampled and tested in accordance with CDOT requirements.

3.11.3.5. Sources
Sources of aggregates shall be selected in accordance with CDOT requirements.

3.11.4. Sampling Pavement Sections During Construction
The Contractor shall control his operations by measurements to ensure placement of materials to the thickness specified. Thickness of the aggregate base courses shall be measured at intervals in such a manner as to ensure one measurement for each 500 square yards or part thereof of aggregate base course. Measurements shall be made in 3-inch diameter test holes penetrating the full depth of the base course. Measurements may be made by the Government for verification of compliance; however, the Contractor shall not depend on such measurements for his control of operations.

3.11.5. Bituminous Materials
Samples of bituminous materials shall be taken by the Contractor, performed in accordance with CDOT requirements. Tests necessary to determine conformance with requirements specified herein shall be performed by the Contractor.

3.11.6. Bituminous Mixtures
Samples of plant mixtures shall be taken before the material is placed in the pavement and shall be tested to determine conformance with the specified test properties in paragraph TEST PROPERTIES OF BITUMINOUS MIXTURES and paragraph ACCEPTABILITY OF WORK.

3.11.6.1. Marshall Tests
One set (three specimens) of tests shall be made for each half day's placement of bituminous mixture.

3.11.6.2. Extraction Tests
Extraction tests shall be made to determine bitumen content and aggregate gradation at the same frequency specified above for Marshall tests.

3.11.6.3. Immersion Compression Tests
One set of tests shall be made for the first day's construction and thereafter whenever there is any change in materials or job-mix formula.

3.11.6.4. Compaction of Bituminous Surface and Intermediate Course
Density of the compacted mixture of the bituminous surface and intermediate courses shall be between 97% and 100% (joint density 95% to 100%) of the maximum laboratory compacted density. The maximum laboratory compacted specimens shall be determined from the same mixture taken from the plant. Densities of the in-place compacted mixture may be determined by the nuclear method in accordance with \-ASTM D 2950-\ for Contractor quality control purposes. In any event, the basis of acceptance for density shall be determined from the specific gravity method as described herein below.

3.12. DELIVERY, STORAGE, AND HANDLING OF MATERIALS

3.12.1. Mineral Aggregates
Mineral aggregates shall be delivered, stored, and handled in accordance with CDOT requirements. Also, mineral aggregates shall be delivered to the site of the bituminous mixing plant and stockpiled in such manner as to preclude fracturing of aggregate particles, segregation, contamination, or intermingling of different materials in the stockpiles or cold-feed hoppers. Furthermore, mineral filler shall be delivered, stored, and introduced into the mixing plant in a manner to preclude exposure to moisture or other detrimental conditions.

3.12.2. Bituminous Materials
Bituminous materials shall be delivered, stored, and handled in accordance with CDOT requirements. Also, these materials shall be maintained at appropriate temperature during storage but shall not be heated by application of direct flame to walls of storage tanks or transfer lines. Storage tanks, transfer lines, and weigh buckets shall be thoroughly cleaned before a different type or grade of bitumen is introduced into the system. The asphalt cement shall be heated sufficiently to allow satisfactory pumping of the material; however, the storage temperature of the material shall be maintained below 300 degrees F.

3.13. STORAGE OF BITUMINOUS PAVING MIXTURES
Storage shall conform to the applicable requirements of CDOT; however, in no case shall mixtures be stored for more than four hours.

3.14. TRANSPORTATION OF BITUMINOUS MIXTURES
Transportation from paving plant to site shall be performed in accordance with all applicable CDOT requirements.

3.15. ACCESS TO PLANT AND EQUIPMENT
The Contracting Officer shall have access at all times to all parts of the paving plant for checking adequacy of the equipment in use; inspecting operation of the plant; verifying weights, proportions, and character of materials, and, checking temperatures maintained in preparation of the mixtures.

3.16. WAYBILLS AND DELIVERY TICKETS
Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified waybills and certified delivery tickets for all aggregates and bituminous materials actually used in construction.

3.17. SAMPLING FINISHED PAVEMENTS
Samples of the finished pavement shall be obtained by the Contractor. The location of the samples shall be as directed and the cores shall be at least 4 inches in diameter. The samples shall be tested by the Contractor to determine conformance to density, thickness, and, if directed, other specified requirements. Specimens shall be tested in accordance with the requirements of \-ASTM D 2726-\. Three samples shall be taken and tested for each half day's placement of bituminous mixture. Two additional cores shall be obtained from the longitudinal joint. The Contractor shall furnish power saw, core drill, or other required tools, as well as all labor required to take samples, and shall fill all cores holes with new material at no additional cost to the Government. The Contractor shall also meet all requirements as described herein.

3.18. JOINTS

3.18.1. General
Bituminous pavement joints shall conform to all applicable CDOT requirements. The following stipulations are a supplement to CDOT requirements.

Joints between old and new pavements, between successive work days, or joints that have become cold (less than 175 degrees F) shall be made to ensure continuous bond between the old and new sections of the course. All joints Shall have the same texture and smoothness as other sections of the course. Contact surfaces of previously constructed pavements coated by dust, sand, or other objectionable material shall be cleaned by brushing or shall be cut back as directed by the Contracting Officer. When directed by the Contracting Officer, the surface against which new material is placed shall be sprayed with a thin, uniform coat of bituminous material conforming to paragraphs BITUMINOUS PRIME COAT and BITUMINOUS TACK COAT. Material shall be applied far enough in advance

of placement of a fresh mixture to ensure adequate curing. Care shall be taken to prevent damage or contamination of the sprayed surface.

3.18.2. Transverse Joints

The roller shall pass over the unprotected end of a strip of freshly placed material only when placing is discontinued or delivery of the mixture is interrupted to the extent that the material in place may become cold. In all cases, prior to continuing placement of pavement, the edge of the previously placed pavement shall be cut back to expose an even vertical surface for the full thickness of the course. In continuing placement of a strip, the mechanical spreader shall be positioned on the transverse joint so that sufficient hot mixture will be spread to obtain a joint after rolling that conforms to the required density and smoothness specified herein.

3.18.3. Longitudinal Joints

Edges of a previously placed strip shall be prepared such that the pavement in and immediately adjacent to the joint between this strip and the succeeding strip meets the requirements for grade, smoothness, and density specified in paragraph ACCEPTABILITY OF WORK.

3.19. ACCEPTABILITY OF WORK

3.19.1. Grade

Grade-conformance tests shall be conducted by the Contractor. The finished surface of the pavement shall be tested for conformance with plan-grade requirements. Within five working days after completion of placement, the Contractor shall inform the Contracting Officer in writing of results of grade-conformance tests. The finished grade of each pavement area shall be determined by running lines of levels at intervals of 25 feet or less, longitudinally and transversely, to determine the elevation of the completed pavement. In areas where the grade exceeds the plan-grade tolerance given in paragraph GRADE AND SURFACE SMOOTHNESS REQUIREMENTS by more than 40 percent, the Contractor shall remove the deficient area and replace with fresh, acceptable paving mixture at no additional cost to the Government. Sufficient material shall be removed to allow at least two inches of asphalt concrete to be placed. Skin patching for correcting low areas or planing for correcting high areas shall not be permitted.

3.19.2. Surface Smoothness

After completion of final rolling, the compacted surface shall be tested by the Contractor with a 12-foot straightedge. Measurements shall be made perpendicular to and across all mats at distances along the mat not to exceed 25 feet. Location and deviation from straightedge of all measurements shall be recorded. Any joint or mat area surface deviation which exceeds the tolerance given in paragraph GRADE AND SURFACE SMOOTHNESS REQUIREMENTS by more than 40 percent shall be corrected to meet the specification requirements. The Contractor shall remove the deficient area and replace with fresh, acceptable paving mixture at no additional cost to the Government. Sufficient material shall be removed to allow at least two inches of asphalt concrete to be placed. Skin patching for correcting low areas or planing for correcting high areas shall not be permitted.

SECTION 02580

PAVEMENT MARKINGS
02/91

PART 1 GENERAL

1.1 REFERENCES

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

STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO (CDOH) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1999 EDITION.

CDOH Section 713 Traffic Control Materials

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

\-AASHTO M 248-\ (1991I) Ready-Mixed White and Yellow Traffic Paints

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM D 4505-\ (1996) Preformed Plastic Pavement Marking Tape for Extended Service Life

1.2 NOT USED

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the "G" designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-03 Product Data

Equipment Lists; G-AO.

Lists of proposed equipment to be used in performance of construction work, including descriptive data, and notifications of proposed Contractor actions as specified in this section.

SD-08 Manufacturer's Instructions

Mixing, Thinning and Application.

Manufacturer's current printed product description and Material Safety Data Sheets (MSDS) for each type paint/color proposed for use.

SD-06 Test Reports

Material Tests.

Certified copies of the test reports, prior to the use of the materials at the jobsite. Testing shall be performed in an approved independent laboratory.

SD-07 Certificates

Volatile Organic Compound (VOC) Content.

Certificate stating that the proposed pavement marking paint meets the VOC regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located.

1.4 DELIVERY AND STORAGE
All materials shall be delivered and stored in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which shall be plainly legible at time of use.

1.5 EQUIPMENT
All machines, tools and equipment used in the performance of the work shall be approved and maintained in satisfactory operating condition. Equipment operating on roads and runways will display low speed traffic markings and traffic warning lights.

1.5.1 Paint Application Equipment
The equipment to apply paint to pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. The machine shall have a speed during application not less than 5 mph, and shall be capable of applying the stripe widths indicated, at the paint coverage rate specified in paragraph APPLICATION, and of even uniform thickness with clear-cut edges. Equipment used for marking streets and highways shall be capable of placing the prescribed number of lines at a single pass as solid lines, intermittent lines or a combination of solid and intermittent lines using a maximum of two different colors of paint as specified. The paint applicator shall have paint reservoirs or tanks of sufficient capacity and suitable gauges to apply paint in accordance with requirements specified. Tanks shall be equipped with suitable air-driven mechanical agitators. The spray mechanism shall be equipped with quick-action valves conveniently located, and shall include necessary pressure regulators and gauges in full view and reach of the operator. Paint strainers shall be installed in paint supply lines to insure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media approved for use. Pneumatic spray guns shall be provided for hand application of paint in areas where the mobile paint applicator cannot be used.

1.5.2 <u>Not Used</u>

1.5.3 <u>Not Used</u>

1.5.4 Preformed Tape Application Equipment
Mechanical application equipment shall be used for the placement of preformed marking tape. Mechanical application equipment shall be defined as a mobile pavement marking machine specifically designed for use in applying precoated, pressure-sensitive pavement marking tape of varying widths, up to 12 inches. The applicator shall be equipped with rollers, or other suitable compactive device, to provide initial adhesion of the preformed, pressure-sensitive marking tape with the pavement surface. Additional hand-operated rollers shall be used as required to properly seat the thermoplastic tape.

1.5.5 Surface Preparation Equipment

1.5.5.1 Sandblasting Equipment

Sandblasting equipment shall include an air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. The compressor shall be capable of furnishing not less than 150 cfm of air at a pressure of not less than 90 psi at each nozzle used, and shall be equipped with traps that will maintain the compressed air free of oil and water.

1.5.5.2 Waterblast Equipment
The water pressure shall be specified at 2600 psi at 140 degrees F in order to adequately clean the surfaces to be marked.

1.5.6 Traffic Controls
Suitable warning signs shall be placed near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Small markers shall be placed along newly painted lines or freshly placed raised markers to control traffic and prevent damage to newly painted surfaces or displacement of raised pavement markers. Painting equipment shall be marked with large warning signs indicating slow-moving painting equipment in operation.

1.6 HAND-OPERATED, PUSH-TYPE MACHINES
All machines, tools, and equipment used in performance of the work shall be approved and maintained in satisfactory operating condition. Hand-operated push-type machines of a type commonly used for application of paint to pavement surfaces shall be acceptable for marking small streets and parking areas. Applicator machine shall be equipped with the necessary paint tanks and spraying nozzles, and shall be capable of applying paint uniformly at coverage specified. Sandblasting equipment shall be provided as required for cleaning surfaces to be painted. Hand-operated spray guns shall be provided for use in areas where push-type machines cannot be used.

PART 2 PRODUCTS

2.1 PAINT

The paint shall be homogeneous, easily stirred to smooth consistency, and shall show no hard settlement or other objectionable characteristics during a storage period of 6 months. Paint for roads and streets shall conform to\-AASHTO M 248-\color as indicated. Pavement marking paints shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials shall conform to the restrictions of the local Air Pollution Control District.

2.2 NOT USED

2.3 PREFORMED TAPE
The preformed tape shall be an adherent reflectorized strip in accordance with \-ASTM D 4505-\ Type I or IV, Class optional. Material and reflectors shall conform to CDOH Section 714.0.

2.4 NOT USED

2.5 NOT USED

2.6 SAMPLING AND TESTING
Materials proposed for use shall be stored on the project site in sealed and labeled containers, or segregated at source of supply, sufficiently in advance of needs to allow 60 days for testing. Upon notification by the Contractor that the material is at the site or source of supply, a sample shall be taken by random selection from sealed containers by the Contractor in the presence of a representative of the Contracting Officer. Samples shall be clearly identified by designated name, specification number, batch number, manufacturer's

formulation number, project contract number, intended use, and quantity involved. Testing shall be performed in an approved independent laboratory. If materials are approved based on reports furnished by the Contractor, samples will be retained by the Government for possible future testing should the material appear defective during or after application.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surfaces to be marked shall be thoroughly cleaned before application of the pavement marking material. Dust, dirt, and other granular surface deposits shall be removed by sweeping, blowing with compressed air, rinsing with water or a combination of these methods as required. Rubber deposits, surface laitance, existing paint markings, and other coatings adhering to the pavement shall be completely removed with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion as directed. Areas of old pavement affected with oil or grease shall be scrubbed with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinsed thoroughly after each application. After cleaning, oil-soaked areas shall be sealed with cut shellac to prevent bleeding through the new paint. Pavement surfaces shall be allowed to dry, when water is used for cleaning, prior to striping or marking. Surfaces shall be recleaned, when work has been stopped due to rain.

3.1.1 Not Used

3.1.2 Cleaning Existing Pavement Markings

In general, markings shall not be placed over existing pavement marking patterns. Existing pavement markings that are in good condition that interfere with or conflict with the newly applied marking patterns shall be removed. Deteriorated or obscured markings that are not misleading or confusing or interfere with the adhesion of the new marking material do not require removal. New preformed pavement markings shall not be applied over existing preformed or thermoplastic markings. Whenever grinding, scraping, sandblasting or other operations are performed the work must be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed the pavement surface shall be blown off with compressed air to remove residue and debris resulting from the cleaning work.

3.2 APPLICATION

All pavement markings and patterns shall be placed as shown on the plans.

3.2.1 Paint

Paint shall be applied to clean, dry surfaces, and only when air and pavement temperatures are above 40 degrees F and less than 95 degrees F. Paint temperature shall be maintained within these same limits. New asphalt pavement surfaces shall be allowed to cure for a period of not less than 30 days before applications of paint. Paint shall be applied pneumatically with approved equipment at rate of coverage specified herein. The Contractor shall provide guide lines and templates as necessary to control paint application. Special precautions shall be taken in marking numbers, letters, and symbols. Edges of markings shall be sharply outlined.

3.2.1.1 Rate of Application

Nonreflective Markings: Paint shall be applied evenly to the pavement surface to be coated at a rate of 105 plus or minus 5 square feet per gallon.

3.2.1.2 Drying

The maximum drying time requirements of the paint specifications will be strictly enforced to prevent undue softening of bitumen, and pickup, displacement, or

discoloration by tires of traffic. If there is a delay in drying of the markings, painting operations shall be discontinued until cause of the slow drying is determined and corrected.

3.2.2 Not Used

3.2.3 Preformed Tape

The pavement surface temperature shall be a minimum of 60 degrees F and the ambient temperature shall be a minimum of 60 degrees F and rising. The preformed markings shall be placed in accordance with the manufacturer's written instructions.

SECTION 02720

STORM-DRAINAGE SYSTEM
06/91

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 294	(1998) Corrugated Polyethylene Pipe, 12 to 48 in. Diameter

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM A 48-\	(1994a) Gray Iron Castings
\-ASTM C 76-\	(1999) Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
\-ASTM C 443-\	(1998) Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
\-ASTM C 478-\	(1997) Precast Reinforced Concrete Manhole Sections
\-ASTM C 923-\	(1998) Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
\-ASTM D 1751-\	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
\-ASTM D 1752-\	(1984; R 1996el) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
\-ASTM D 2321-\	(1989; R 1995) Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
\-ASTM D 2657-\	(1996) Heat Fusion Joining of Polyolefin Pipe and Fittings
\-ASTM D 3350-\	(1998a) Polyethylene Plastics Pipe and Fittings Materials
\-ASTM F 477-\	(1999) Elastomeric Seals (Gaskets) for Joining Plastic Pipe
\-ASTM F 714-\	(1997) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

\-ASTM F 1417-\ (1992; R 1998) Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air

1.2 NOT USED

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the "G" designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-08 Manufacturer's Instructions

Placing Pipe.

Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

Pipe For Culverts, Storm Drains, and the Low-Flow Drainage Pipe.

Certification demonstrating conformance to applicable pipe specifications, before pipe is installed.

Resin Certification.

Pipeline Testing.

Hydrostatic Test on Watertight Joints.

Frame and Cover or Gratings.

Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed. Certification on the ability of frame and cover or gratings to carry the imposed live load.

Precast Manhole Concrete Flat Tops

Certification on the ability of precast manhole flat tops to carry the imposed live load.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground, and shall be stored in a manner that will protect the materials from damage. The inside of pipes and fittings shall be kept free of excessive dirt, debris, and other contaminants. Gasket materials and plastic materials including PE pipe and fittings shall be protected from exposure to direct sunlight when the exposure period exceeds 14 days.

1.4.2 Handling

Materials shall be handled in such a manner as to ensure delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, and shall not be dragged under any circumstances.

PART 2 PRODUCTS

2.1 *PIPE FOR CULVERTS, STORM DRAINS, AND LOW-FLOW DRAINAGE PIPE*
Pipe for culverts, storm drains, and the low-flow drainage pipe shall be non-perforated and of the sizes indicated, and shall conform to requirements specified below.

2.1.1 Concrete Pipe
Shall meet all requirements of \-ASTM C 76-\, Class III.

2.1.2 Polyethylene (PE) Pipe

The pipe manufacturer's resin certification indicating the cell classification of PE used to manufacture the pipe shall be submitted prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D 3350.

2.1.2.1 Smooth Wall PE Pipe

ASTM F 714, with a DR of 21 or less for pipes 3 to 24 inches in diameter. Pipe shall be produced from PE certified by the resin producer as meeting requirements of ASTM D 3350, minimum cell class 335434C.

2.2 JOINTS
Pipe joints shall be one of the following types.

2.2.1 Concrete Pipe

2.2.1.1 Not Used

2.2.1.2 Not Used

2.2.1.3 Not Used

2.2.1.4 Not Used

2.2.1.5 Cold-Applied Bituminous Compound Joints
a. Materials: Cold-applied bituminous compound for joints shall be a bituminous material of such consistency that it can be applied to the joints with a trowel when the temperature of the air is between 20 degrees F. and 100 degrees F.

b. Installation: Sealing compounds shall follow recommendations of the particular manufacturer with regard to special installation requirements. Surfaces to receive compounds shall be dry and clean. Sealing compounds shall be affixed to the pipe not more than 3 hours prior to installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Sealing compounds shall be inspected before installation of the pipe, any loose or improperly affixed sealing compound shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pulled together. If, while making the joint a slight protrusion of the material is not visible along the entire inner and outer circumference of the joint when the joint is pulled up, the pipe shall be removed and the joint remade. After the joint is made, all inner protrusions will be cut off flush with the inner surface of the pipe.

2.2.1.6 Flexible Gasket Joints

a. Materials: Flexible joints shall be made with plastic or rubber-type gaskets. The design of joints and the physical requirements for plastic gaskets shall conform to \-AASHTO M 198-\, and rubber-type gaskets shall conform to \-ASTM C 443-\. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber-type gasket are permitted if the nominal diameter of the pipe being gasketed exceeds 54 inches.

b. Test Requirements: Rubber gaskets shall comply with oil resistant gasket requirements of \-ASTM C 443-\. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed.

c. Installation: Gaskets and jointing materials shall be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pushed home. If, while the joint is being made the gasket becomes visibly dislocated the pipe shall be removed and the joint remade.

2.2.2 Polyethylene (PE) Pipe

The low-flow drainage pipe, shown on drawing C-12 of the upstream package, shall be manufactured of concrete or smooth-wall polyethyelene (PE). Corrugated PE pipe shall not be used. Pipe shall meet the following requirements.

2.2.2.1 Smooth Wall PE Plastic Pipe

Pipe shall be joined using the butt fusion method, in accordance with ASTM D 2657. All recommendations of the pipe manufacturer shall be followed regarding joining sections of pipe.

2.3 DRAINAGE STRUCTURES

2.3.1 Manholes

Construction shall be of precast reinforced concrete manhole sections, complete with frames and covers and with fixed galvanized steel ladders where indicated. Manhole bases and junction boxes shall be cast-in-place or precast reinforced concrete. Precast reinforced concrete manhole bases, risers, and tops shall conform to \-ASTM C 478-\. *Precast manhole concrete flat tops*\ shall be certified for ASHTO H-20 wheel loads. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall be smoothed to a uniform surface on both interior and exterior of the structure <u>or</u> shall be made with flexible watertight, rubber-type gaskets meeting the requirements of paragraph FLEXIBLE GASKET JOINTS.

2.3.2 Curb and Area Inlets

Construction shall be of cast-in-place or precast reinforced concrete as indicated.

2.3.3 Headwalls

Construction shall be of reinforced concrete, as indicated.

2.3.4 Connectors

RCP pipe connections to manholes, inlets and other drainage structures shall be made with flexible, watertight connectors conforming to \-ASTM C 923-\.

2.4 MISCELLANEOUS MATERIALS

2.4.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for 3000 psi~\ concrete under Section \=03300=\ 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 \-ASTM C 231-\. The concrete covering over steel reinforcing shall not be 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 3 inches between steel and ground. Expansion-joint filler material shall conform to \-ASTM D 1751-\, or \-ASTM D 1752-\, or shall be resin-impregnated fiberboard conforming to the physical requirements of \-ASTM D 1752-\.

2.4.2 Not Used

2.4.3 *Frame and Cover or Gratings*\

Frame and cover or gratings shall be cast gray iron, \-ASTM A 48-\, Class 35B or cast ductile iron, \-ASTM A 536-\, Grade 65-45-12. Weight, shape, size, and waterway openings for grates and curb inlets shall be as indicated on the plans. Covers and gratings shall have a minimum transverse proof-load strength of 25,000 pounds.

PART 3 EXECUTION

3.1 EXCAVATION, TRENCHING, AND BACKFILLING FOR PIPE CULVERTS, STORM DRAINS, DRAINAGE STRUCTURES, AND THE LOW-FLOW DRAINAGE PIPE

Excavation of pipe trenches and backfilling for culverts, storm drains, and the low-flow drainage pipe shall be in accordance with the applicable portions of Section \=02222=\ EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. The Contractor shall exercise care so as not to damage the low-flow drainage pipe during handling, installation, backfilling, or during placement of grouted-stone boulders adjacent to the pipe. Grouted-stone boulders shall not be placed within 12-inches of the sides of the low-flow drainage pipe. In addition, grouted-stone boulders shall not be placed beneath the low-flow drainage pipe. The low-flow drainage pipe shall be placed on bedding material meeting requirements of this specification section. The space between the low-flow drainage pipe and grouted-stone boulders shall be completely filled with grout meeting requirements of specification section 02246, in a manner that will not damage the pipe.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. Bedding shall conform to the details on the drawings and shall be in accordance with the applicable portions of Section \=02222=\ EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. The following types of bedding shall be used:

3.2.1 Concrete Pipe

Concrete pipe shall be bedded with a Class C type bedding and shall be carefully bedded 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 the pipe or pipe 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 of joint.

3.2.2 Plastic Pipe

Bedding for PE pipe shall meet the requirements of ASTM D 2321. Bedding, haunching, and initial backfill shall be either Class IB or II material. If PE pipe is used for the low-flow drainage pipe, the Contractor shall carefully place pipe, grout, and backfill in a manner that will not damage the pipe.

3.3 *PLACING PIPE*\

Each pipe shall be carefully examined before being laid, and defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to the direct sunlight prior to laying as needed to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. All water generated during dewatering activities shall be disposed of in accordance with paragraph: Protection of Water Resources in Section \=01355A=\ ENVIRONMENTAL PROTECTION. All pipe in place shall be inspected before backfilling, and those pipes damaged during placement shall be removed and replaced. Plastic pipe shall have a maximum allowable deflection not exceeding 7.5%.

3.3.1 Concrete Pipe

Laying shall proceed upgrade with spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow.

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02915

CUTTINGS

02/00

PART 1 GENERAL Attachment: ATT-1, Single Willow Stake Detail

1.1 REFERENCES
1.2 SUBMITTALS
1.3 TRANSPLANTING PLAN
1.4 PLANT MATERIAL SURVIVABILITY
1.5 CUTTINGS
1.5.1 Single Willow Live Stakes
1.6 DELIVERY OF MATERIALS
1.6.1 Delivered Topsoil
1.6.2 Soil Amendments
1.6.3 Pesticide Material
1.7 PLANT MATERIAL IDENTIFICATION
1.8 INSPECTION OF MATERIALS
1.9 STORAGE OF MATERIALS
1.10 HANDLING OF MATERIALS
1.11 WARRANTY

PART 2 PRODUCTS

2.1 TOPSOIL
2.2 SOIL AMENDMENTS
2.2.1 Fertilizer
2.3 ROOTING HORMONE
2.4 WATER
2.5 PESTICIDE

PART 3 EXECUTION

3.1 TRANSPLANTING PLANT MATERIAL TIME AND CONDITIONS
3.1.1 Transplanting Conditions
3.1.2 Underground Utilities
3.1.3 Protecting Existing Vegetation
3.1.4 Installing Site Tests
3.1.4.1 Soil Test
3.1.5 Plant Material Harvesting
3.1.5.1 Timing of Harvest and Installation
3.1.5.2 Source and Species of Live Cut Materials
3.1.5.3 Cutting
3.1.5.4 Harvesting Site
3.1.5.5 Binding and Storage
3.1.5.6 Transportation
3.1.5.7 Arrival Time
3.1.5.8 Inspection and Approval
3.2 INSTALLING SITE PREPARATION
3.2.1 Finished Grade and Topsoil

3.2.2 Layout
3.3 INSTALLING SITE EXCAVATION
3.3.1 Obstructions Below Ground
3.4 INSTALLATION
3.4.1 Single Live Willow Stakes
3.4.2 Adding Rooting Hormone and Fertilizer
3.4.3 Watering
3.5 MAINTENANCE DURING TRANSPLANTING OPERATION
3.6 APPLICATION OF PESTICIDE
3.6.1 Technical Representative
3.6.2 Application
3.7 RESTORATION AND CLEAN UP
3.7.1 Restoration
3.7.2 Clean Up
3.8 PLANT ESTABLISHMENT PERIOD
3.8.1 Commencement
3.8.2 Maintenance During Establishment Period
3.8.2.1 Weeding
3.8.2.2 Pesticide Treatment
3.8.2.3 Maintenance Record
3.8.3 Acceptable Plant Material
3.8.4 Unhealthy Or Dead Plant Material
3.8.4.1 Dead Plant Material
3.8.4.2 Replacement Plant Material
3.8.5 Maintenance Instructions

-- End of Section Table of Contents --

SECTION 02915

CUTTINGS

02/00

PART 1 GENERAL

Attachment: ATT-1, Single Willow Stake Detail

This work shall consist of furnishing all plants, labor, materials, and equipment and performing all work necessary and incidental to installing Sandbar Willow stakes in accordance with these documents and on-site instructions. Live poles are straight branches or saplings that have been cut and pruned from dormant living plant material (plants that have lost their leaves).

1.1 REFERENCES

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

AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)

ANLA Z60.1	(1996) Nursery Stock

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4972	(1995a) pH of Soils
ASTM D 5268	(1996) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment;.

A listing of equipment to be used for the transplanting operation,including size, model, year of equipment.

SD-05 Design Data

Finished Grade and Topsoil;.
Underground Utilities;.
Delivered Topsoil;.
Obstructions Below Ground;.

Finished grade status; location of underground utilities and facilities; and availability of topsoil from the stripping and stock piling operation.

SD-06 Test Reports

Soil Test;.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

Transplanting Plan;.

Methods to be used for each plant species to be transplanted ensuring survivability.

SD-07 Certificates

Topsoil;.
Fertilizer;.
Soil Amendment;.
Pesticide;G-AO.

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following.

a. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

b. Fertilizer. Chemical analysis and composition percent.

c. Soil Amendment. Composition and source.

d. Pesticide. EPA registration number and registered uses.

SD-08 Manufacturer's Instructions

Application of Pesticide;G-AO.

Pesticide treatment plan with sequence of treatment work, plus dates and times. The plan shall state the applicator's years of previous experience in applying pesticides of this type or under these conditions, if requested by the Contracting Officer. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

Plant Establishment Period;G-AO.

Calendar time period for the plant establishment period. When there is more than one establishment period, the boundaries of the planted areas covered for each period shall be described.

Maintenance Record;G-AO.

Maintenance work performed, quantity of plant losses, and replacements; and

diagnosis of unhealthy plant material.

SD-10 Operation and Maintenance Manuals

Maintenance Instructions;G-AO.

Instruction for care of installed plant material during initial establishment period and long term care.

1.3 TRANSPLANTING PLAN

A transplanting plan shall be submitted and shall delineate methods and times for identifying sources of cuttings, harvesting cuttings, bundling cuttings, removing, storing, transporting, planting, watering, and maintenance to ensure survivability. The plan shall also include equipment, anti-desiccant and pesticides to be used. A listing of the plant material to be transplanted shall be provided by common name and botanical name as listed under "Nomenclature" in ANLA Z60.1; classification; and length.

1.4 PLANT MATERIAL SURVIVABILITY

Plant material survivability shall be determined by growing conditions and establishment of leaves or crown growth and root system.

1.5 CUTTINGS

1.5.1 Single Willow Live Stakes

The live branches which shall be trimmed and cut to length for this installation shall be a minimum of four feet (4') long, a maximum of five feet (5')long and a minimum of one-half inch (1/2") in diameter for bare ground planting. These cuttngs shall be free from all side branches. The "root" end of each cutting shall be cut at a 45-degree angle with the top end cut perpendicular to the length. This serves as an indicator of which end of the stake to tamp into the ground and also facilitates the tamping process.

1.6 DELIVERY OF MATERIALS

1.6.1 Delivered Topsoil

Prior to the delivery of any topsoil, the availability of topsoil shall be verified in paragraph TOPSOIL. A soil test shall be provided for delivered topsoil.

1.6.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis.

1.6.3 Pesticide Material

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses.

1.7 PLANT MATERIAL IDENTIFICATION

Plant material to be transplanted shall be tagged and/or shown on drawings. Transplanted plant material shall be delivered with attached, durable, waterproof labels and weather-resistant ink or imprinted tags, stating the correct botanical plant name and size.

1.8 INSPECTION OF MATERIALS

Materials shall be inspected for compliance with paragraph PRODUCTS, paragraph PLANT MATERIAL SURVIVABILITY and paragraph PLANT MATERIAL IDENTIFICATION. Open soil amendment containers or wet soil amendments shall be rejected. Topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material larger than 1-1/2 inch diameter shall be rejected. Topsoil that contains viable plant material and plant parts shall be rejected. Unacceptable material shall be removed from the job site.

1.9 STORAGE OF MATERIALS

Storage of material shall be in designated areas. Soil amendments shall be stored in dry locations and away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with planting operation material.

1.10 HANDLING OF MATERIALS

Materials shall not be dropped from vehicles. Materials found to be in unacceptable condition shall be replaced at no additional cost to the Government.

1.11 WARRANTY

Transplanted plant material shall have a warranty for survivability as defined in paragraph PLANT MATERIAL SURVIVABILITY, and plant growth to be in a vigorous growing condition for a minimum 24 month calendar time period. The warranty of plant growth shall be provided regardless of the contract time period. When the transplanted plant material is determined to be unhealthy in accordance with paragraph PLANT ESTABLISHMENT PERIOD, it shall be replaced once under this warranty.

PART 2 PRODUCTS

2.1 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the plant material specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.2 SOIL AMENDMENTS

Soil amendments shall consist of fertilizer meeting the following requirements.

2.2.1 Fertilizer

Fertilizer shall be controlled release, commercial grade, suitable for use on newly transplanted plant material; free flowing, pellet or tablet form; niform in composition; and consistent with a prescribed nitrogen-phosphorus-potassium ratio. Use Osmocote or approved equal.

2.3 ROOTING HORMONE

Rooting hormone shall be applied to all cuttings prior to use. Hormone shall be the same as or equal to Vitastart or Rhizopon.

2.4 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall be potable or supplied by an existing irrigation system.

2.5 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

PART 3 EXECUTION

3.1 TRANSPLANTING PLANT MATERIAL TIME AND CONDITIONS

3.1.1 Transplanting Conditions

All transplanting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to all transplanting operations, proposed transplanting times shall be submitted for approval.

3.1.2 Underground Utilities

The location of underground utilities and facilities at both the removal and installing sites shall be verified and marked. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.1.3 Protecting Existing Vegetation

When there are established turf at both the removal and installing sites, the turf shall be covered and/or protected during the operation. Existing trees, shrubs, and plant beds at both the removal and installing site that are to be preserved shall be barricaded along the dripline. The area shall be barricaded and protected from damage by a tree barricade or other measure. Damage to existing plant material shall be mitigated by the Contractor at no additional cost to the Government. Damage shall be accessed by a state certified arborist or other approved professional using the National Arborist Association's tree valuation guideline.

3.1.4 Installing Site Tests

3.1.4.1 Soil Test

Delivered topsoil, excavated plant pit soil, and stockpiled topsoil shall

be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection onsite shall be random over the entire installing site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the plant material to be transplanted.

3.1.5 Plant Material Harvesting

3.1.5.1 Timing of Harvest and Installation

All willow staking shall be performed between Feb. 1 and Ap. 1 or as directed by Engineer.

3.1.5.2 Source and Species of Live Cut Materials

Live cuttings shall be taken from approved, existing, natural, native growing sites. All cuttings shall be taken from a dormant plant at least one year old. Potential harvest sites and shall be approved before proceeding with harvest. Willow species for single live willows stakes shall be **Salix exigua (Sandbar Willow)** or approved equivalent.

3.1.5.3 Cutting

The use of weed whips with metal blades, loppers, brush cutters, and pruners is permitted, provided that they are used in such a manner that they leave clean cuts. The use of chain saws is not permitted. Live plant materials shall be cut and handled with care to avoid bark stripping and trunk wood splitting. Cuts shall be made eight-to-ten inches (8"-10") from the ground when cutting from the approved sites. Cuts shall be made flat or at a blunt angle.

3.1.5.4 Harvesting Site

Contractor shall harvest only up to 30 percent of available branches at all harvest sites. No more than 2/3's of any plant shall be removed. Handle plant material with care to avoid bark stripping and branch splitting. The harvesting site must be left clean and tidy. Excess woody debris should be removed from the site and disposed of properly, or, if approved by Engineer, shall be cut up into sixteen-inch (16") lengths and evenly distributed around the site.

3.1.5.5 Binding and Storage

Live branch cuttings shall be bound together securely with twine at the collection site, in groups, for easy handling and for protection during transport. Live branch cuttings shall be grouped in such a manner that they stay together when handled. Outside storage locations shall be continually shaded and protected from the wind. Cuttings shall be heeled-in moist soils or kept in water until ready for planting. Cuttings shall be protected from freezing and drying at all times.

3.1.5.6 Transportation

During transportation, the live cuttings shall be placed on the transport vehicles in an orderly fashion, to prevent damage and to facilitate

handling. The live cuttings shall be covered with a tarp or burlap material during transportation.

3.1.5.7 Arrival Time

All cuttings shall arrive on the job site within eight (8) hours of cutting. Upon arrival at the installation site, cuttings shall be inspected for acceptability. Cuttings not installed on the day of arrival at the job site shall be stored and protected (kept in cold storage and in a moist but not wet condition) until installation. All cuttings shall be installed within twenty-four (24) hours after harvesting.

3.1.5.8 Inspection and Approval

Upon arrival at the construction site, live branch cuttings shall be inspected for acceptability. Live cuttings shall be collected from sources that shall be approved prior to the commencement of cutting operations. Only healthy, well-branched, and disease-free stock shall be acceptable.

3.2 INSTALLING SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on drawings, and that the placing of topsoil on the embankments in the areas to be planted have been completed, the smooth grading, and the compaction requirements have been completed in accordance with Section 02300EARTHWORK, prior to the commencement of the transplanting operation.

3.2.2 Layout

Plant material installing sites shall be staked on the project site before any planting is made. Plant material locations may be adjusted to meet field conditions.

3.3 INSTALLING SITE EXCAVATION

3.3.1 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments to plant material location, and planting method shall be submitted for approval.

3.4 INSTALLATION

3.4.1 Single Live Willow Stakes

Live stakes shall be planted where shown on the plans after their locations have been staked and approved by the Engineer. Live stakes shall be tamped directly into the soil and shall protrude 6 inches (6") from the soil surface. In no case will the live stakes protrude more than 8 inches above the soil surface. Only dead blow hammers or rubber mallets shall be used to tamp the live stakes into the soil. Care shall be taken to prevent splitting of the stakes due to impact from the hammers. Sledgehammers shall not be used to tamp the live stakes into the soil. In cases where the soil is too hard to tamp the live stake in directly, a metal rod of one-half inch to three-quarter (½" to ¾") diameter may be driven in first to prepare a pilot hole. Backfill around the installed live stake with the original soil or sand to eliminate air voids, then tamp the ground lightly

around the stake with a hammer to hold it securely in place. A slight saucer shall be formed around each cutting to capture and hold precipitation. After the stakes are fully tamped into the soil, the top one-to-two inches (1"-2") of each live stake shall be pruned to a clean, non-damaged cut. Install beaver protection sleeve around each willow stake. See Attachment One for Single Willow Stake Detail and for Beaver Protection Sleeve.

3.4.2 Adding Rooting Hormone and Fertilizer

Rooting Hormone and fertilizer shall be added as recommended by the manufacturer for the plant material specified.

3.4.3 Watering

A regular watering schedule shall be established. Slow deep watering shall be used. Plants shall be watered immediately after backfilling, until completely saturated. Run-off and puddling shall be prevented. Watering of other plant material or adjacent areas shall be prevented.

3.5 MAINTENANCE DURING TRANSPLANTING OPERATION

Installed plant material shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed to prevent desiccation and shall continue until the plant establishment period commences. Installed areas shall be kept free of weeds, grass, and other undesired vegetation. The maintenance includes maintaining the watering, and adjusting settling.

3.6 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.6.1 Technical Representative

The certified, installation pest management coordinator shall be the technical representative, shall be present at all meetings concerning treatment measures for pest or disease control,and may be present during treatment application.

3.6.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.7 RESTORATION AND CLEAN UP

3.7.1 Restoration

Turf areas containing ruts or dead turf, as a result of work under this contract, shall be graded smooth and seeded with the same species. All pavements and facilities that have been damaged from the transplanting operation shall be restored to original condition at the Contractor's expense.

3.7.2 Clean Up

Excess and waste material shall be removed from both removal site and the installed site and shall be disposed offsite at an approved landfill or recycling center. Adjacent paved areas shall be cleared.

3.8 PLANT ESTABLISHMENT PERIOD

3.8.1 Commencement

Contractor shall perform establishment of all stakes for a period of one year after the acceptance of the installation of the stakes. Written calendar time period shall be furnished for the plant establishment period. When there is more than one plant establishment period, the boundaries of the planted area covered for each period shall be described.

3.8.2 Maintenance During Establishment Period

The Contractor is required to carefully monitor the vitality of all new plants and attend to their needs. Maintenance of plant material shall include watering stakes, straightening plant material, correcting girdling; eradicating weeds, insects and disease; and removing and replacing unhealthy plants. The plant material shall be watered as necessary to prevent desiccation and to maintain an adequate supply of moisture within the root zone. An adequate supply of moisture is required to a depth of 3 inches until the first true leaf emerges. After that time only the amount of water necessary to continue healthy plant growth is necessary. Run-off, puddling and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or existing plant material shall be prevented.

3.8.2.1 Weeding

Grass and weeds in the installed areas shall not be allowed to reach a maximum 6 inches height before being completely removed, including the root system.

3.8.2.2 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.8.2.3 Maintenance Record

A record shall be furnished describing the maintenance work performed, the quantity of plant losses, diagnosis of the plant loss, and the quantity of replacements made on each site visit.

3.8.3 Acceptable Plant Material

Plant material shall be undamaged, well shaped, vigorous and healthy with a well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion after transplanting and

in accordance with paragraph PLANT MATERIAL SURVIVABILITY. Plant material showing desiccation, abrasion, sun-scald injury or structural branching damage shall be replaced at no cost to the Government.

3.8.4 Unhealthy Or Dead Plant Material

3.8.4.1 Dead Plant Material

Willow stakes shall be considered established if a minimum of two healthy live willows shafts are each stake when inspected. This includes the emergence of new leaves. This condition shall be determined by scraping on a branch an area 1/16 inchsquare, maximum, to determine if there is a green cambium layer below the bark. The Contractor shall determine the cause for dead plant material and shall provide recommendations for replacement. Dead plant material in excess of the material allowed shall be removed immediately and shall be replaced as soon as seasonal conditions permit.

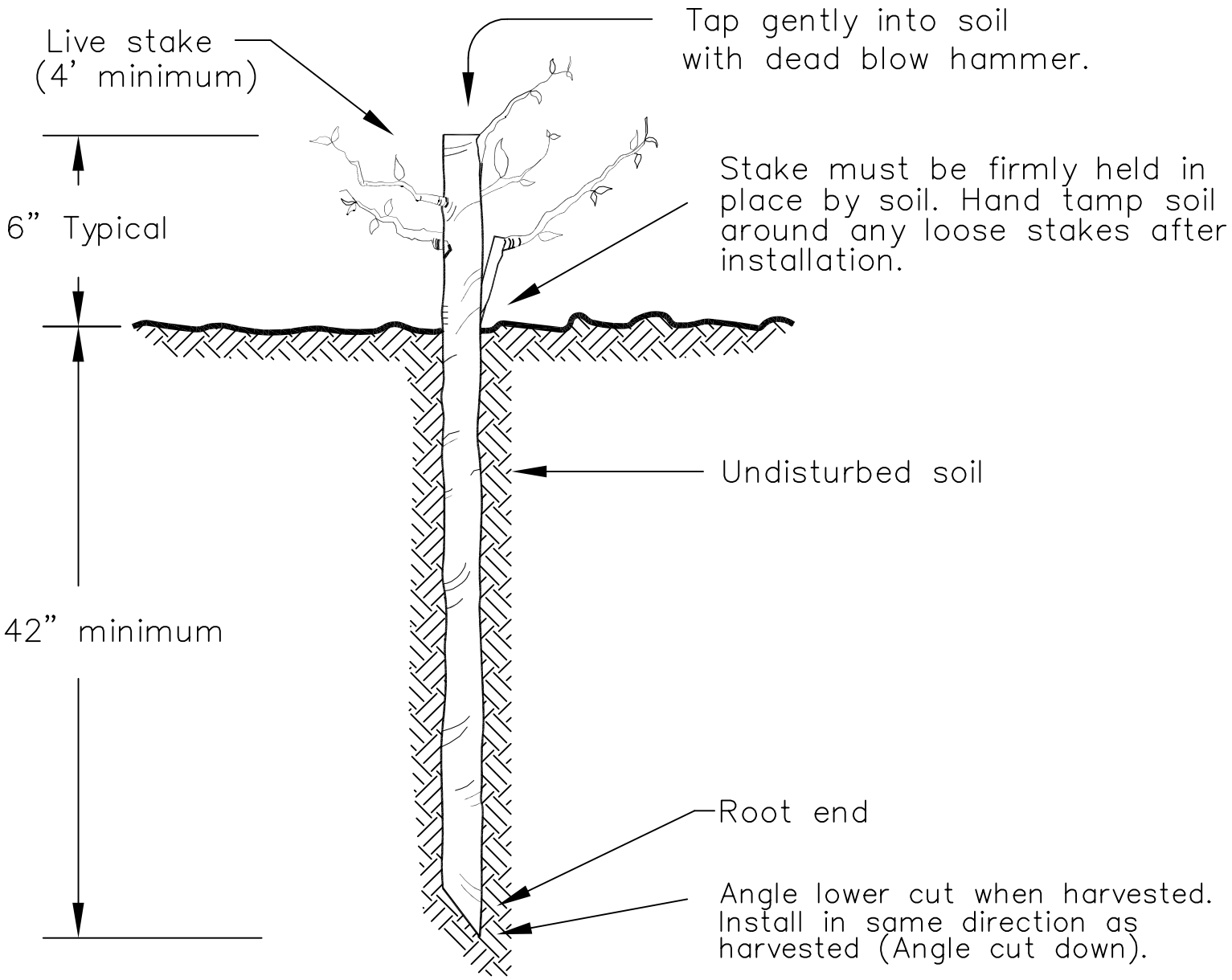
3.8.4.2 Replacement Plant Material

Replacement plant material shall be installed in accordance with paragraph INSTALLATION. Plant material shall be replaced in accordance with paragraph WARRANTY. An extended plant establishment period shall not be required for replacement plant material.

3.8.5 Maintenance Instructions

Written instructions shall be furnished containing drawings and other necessary information for year-round care of the installed plant material; including, when and where maintenance should occur, and the procedures for plant material replacement.

-- End of Section --



Single Willow Stake Detail

ATT–1

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02921

SEEDING

06/98

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SOURCE INSPECTION
1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING
1.4.1 Delivery
1.4.1.1 Delivered Topsoil
1.4.1.2 Soil Amendments
1.4.1.3 Pesticides
1.4.2 Inspection
1.4.3 Storage
1.4.4 Handling
1.4.5 Time Limitation

PART 2 PRODUCTS

2.1 SEED
2.1.1 Seed Classification
2.1.2 Permanent Seed Species and Mixtures
2.1.3 Temporary Seed Species
2.1.4 Quality
2.1.5 Seed Mixing
2.1.6 Substitutions
2.2 TOPSOIL
2.3 SOIL AMENDMENTS
2.3.1 Fertilizer
2.3.2 Organic Material
2.3.2.1 Decomposed Wood Derivatives
2.3.2.2 Recycled Compost
2.4 MULCH
2.4.1 Wood Cellulose Fiber
2.4.2 Tackifier
2.5 WATER
2.6 PESTICIDE
2.7 SURFACE EROSION CONTROL MATERIAL
2.7.1 Surface Erosion Control Blanket
2.7.2 Erosion Control Material Anchors

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS
3.1.1 Seeding Time
3.1.2 Seeding Conditions
3.1.3 Equipment Calibration
3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil
3.2.2 Application of Soil Amendments
3.2.2.1 Applying Fertilizer
3.2.2.2 Applying Organic Materials
3.2.3 Tillage
3.2.4 Prepared Surface
3.2.4.1 Preparation
3.2.4.2 Area Debris
3.2.4.3 Protection
3.3 INSTALLATION
3.3.1 Installing Seed
3.3.1.1 Broadcast Seeding
3.3.1.2 Drill Seeding
3.3.1.3 Rolling
3.3.2 Mulching
3.3.2.1 Hydromulching
3.3.3 Watering Seed
3.4 SURFACE EROSION CONTROL
3.4.1 Surface Erosion Control Material
3.4.2 Temporary Seeding
3.4.2.1 Soil Amendments
3.4.2.2 Remaining Soil Amendments
3.5 QUANTITY CHECK
3.6 APPLICATION OF PESTICIDE
3.6.1 Technical Representative
3.6.2 Application
3.7 RESTORATION AND CLEAN UP
3.7.1 Restoration
3.7.2 Clean Up
3.8 PROTECTION OF INSTALLED AREAS
3.9 SEED ESTABLISHMENT PERIOD
3.9.1 Commencement
3.9.2 Satisfactory Stand of Grass Plants
3.9.2.1 Seeded Areas
3.9.3 Maintenance During Establishment Period
3.9.3.1 Mowing and Weed Control
3.9.3.2 Pesticide Treatment
3.9.3.3 Repair or Reinstall
3.9.3.4 Maintenance Record

-- End of Section Table of Contents --

SECTION 02921

SEEDING
06/98

PART 1 GENERAL

1.1 REFERENCES

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

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01	(Aug 95) Federal Seed Act Regulations Part 201

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

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

SD-03 Product Data

Equipment;
Surface Erosion Control Material;
Chemical Treatment Material;G-AO

Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

Equipment;

A listing of equipment to be used for the seeding operation.

Delivery;

Delivery schedule.

Finished Grade and Topsoil;

Finished grade status.

Topsoil;

Availability of topsoil from the stripping and stock piling operation.

SD-06 Test Reports

Equipment Calibration;

Certification of calibration tests conducted on the equipment used in the seeding operation.

SD-07 Certificates

Seed;G-AO
Topsoil;
Fertilizer;
Organic Material;
Soil Conditioner;
Mulch;
Pesticide; G-AO

Prior to purchasing of seed a complete listing of seed varieties (common name and botanical name) available for use. Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested. Signed statement certifying that seed mixtures have been tested within the last 6 months prior to the date of delivery for seed type, and weed content.

b. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.
c. Fertilizer. Chemical analysis and composition percent.
d. Organic Material: Composition and source.
e. Soil Conditioner: Composition and source.
f. Mulch: Composition and source.
g. Pesticide. EPA registration number and registered uses.

SD-04 Samples

Delivered Topsoil;

Samples taken from several locations at the source.

Soil Amendments;

A 10 pound sample.

Mulch;

A 10 pound sample.

SD-10 Operation and Maintenance Data

Quantity Check;

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

Seed Establishment Period;

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record;

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

Application of Pesticide; G-AO

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

1.3 SOURCE INSPECTION

The source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL.

1.4.1.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.1.3 Pesticides

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

1.4.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. The following shall be rejected: open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 2 inch diameter; and topsoil that contains

viable plants and plant parts. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

Materials shall be stored in designated areas. Seed fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.4.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS-01 and applicable state seed laws. Seed mixtures shall be free from any State listed noxious weeds including but not limited to Russian or Canadian Thistle, European Bindweed, Johnson Grass, and Leafy Spurge.

2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be proportioned by weight: Computation of quantity of seed required is based on the percent of purity and percent of germination.

Pounds of pure live seed (PLS) = pounds of seed x germination x purity.

	% of Mixture	Pounds PLS/Acre
Low-Grow Grass Mix		
Ephrain Crested Wheatgrass (Agropyron cristatum)	30	7.50
Dwarf Perennial Ryegrass (Lolium perenne)	25	6.25
SR3200 Blue Fescue (Festuca ovina)	20	5.00
Reubens Canada Bluegrass (Poa compressa)	15	3.75
Chewings Fescue (Festuca rubra commutata)	10	2.50
	Total	25.0 lbs. PLS/Acre

Wildflowers Mix

Cleome serrulata	Rocky Mountain Bee Plant	0.1
Deophinium virescens	Larkspur	0.1
Liatris punctata	Blazing Star	0.1
Oenothera caespitosa	Stemless Evening primrose	0.1
Oenothera villosa	Tall Evening Primrose	0.1
Gaillardia aristata	Blanket Flower	0.1
Penstemon angustifolia	Narrow Leaf Penstemon	0.1
Linum lewisii	Blue Flax	0.1
Helianthus annuus	Annual Sunflower	0.1
Artemisia ludoviciana	Louisiana Sagewort	0.1
Coreopsis tinctoria	Plains Coreopsis	0.1
Sphaeralcea coccinea	Scarlet Goldmallow	0.1
Artemisia frigida	Fringed Sage	0.1
Erysimum	Wallflower	0.1
Dalea purpurea	Purple Prairie Clover	0.1
Opuntia polyacantha	Prickly Pear Cactus	0.1
	Total	1.6 lbs/acre

2.1.3 Temporary Seed Species

Temporary seed species for surface erosion control or overseeding shall be Annual Ryegrass seeded at a rate of 2 lbs/acre drilled or 4 lbs/acre broadcast.

2.1.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.5 Seed Mixing

Seed mixing may be done by the seed supplier prior to delivery, or on site as directed.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as needed. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of fertilizer and organic material meeting the following requirements. Vermiculite shall not be used.

2.3.1 Fertilizer

The nutrient ratio shall be 18% Nitrogen, 46% Phosphorous, 0% Potassium. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.2 Organic Material

Organic material shall consist of either decomposed wood derivatives or recycled compost.

2.3.2.1 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, yard trimmings, or other wood waste material that is free of stones, sticks, soil, and toxic substances harmful to plants, and is fully composted or stabilized with nitrogen.

2.3.2.2 Recycled Compost

Compost shall be a well decomposed, stable, weed free organic matter source. Compost shall be derived from food; agricultural or industrial residuals; yard trimmings. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35-55 percent by weight. The material shall not contain more than 1 percent by weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.4.2 Tackifier

Tackifier shall be Terratack III or approved equal.

2.5 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life.

2.6 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification, a soil

fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

2.7 SURFACE EROSION CONTROL MATERIAL

Surface erosion control material shall conform to the following:

2.7.1 Surface Erosion Control Blanket

Blanket shall be machine produced mat of knitted straw covered on both sides with a degradable plastic mesh or interwoven degradable thread. Blanket shall be approximately 6.5 feet wide and 1/2 pounds per square yard.

2.7.2 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed from April 1 to May 30 for spring establishment; and from August 1 to September 15 for fall establishment.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed prior to the commencement of the seeding operation. Prior to seeding operations the soil shall be tilled to a depth of no less than 12 inches to allow for root penetration in all areas that have been compacted by construction equipment.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying Fertilizer

Fertilizer shall be applied at the rate of no less than 200 pounds per

acre. Fertilizer shall be incorporated into the soil to a maximum 4 inches depth or may be incorporated as part of the tillage operation.

3.2.2.2 Applying Organic Materials

The organic material shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inch depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inchdepth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Area Debris

Debris and stones over a minimum 2 inch in any dimension shall be removed from the surface.

3.2.4.3 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

The grass and wildflower seed mixture shall be installed in all areas disturbed by construction that are not otherwise shown on the drawings to receive another type of surface treatment. At the time of installation, the permanent seed mixture shall contain all grass and wildflower species, as specified in paragraph 2.1.2, Permanent Seed Species and Mixtures.

Seeding shall occur as specified herein as soon as the soil has been prepared and the environmental conditions are favorable for installation. Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

All areas to be seeded shall be drill seeded except for those areas which

are only accessible to broadcast seeding. Seeding procedure shall ensure even coverage.

3.3.1.1 Broadcast Seeding

Seed shall be uniformly broadcast using broadcast seeders at twice the recommended rate as specified. Half the total rate of seed application shall be broadcast in one direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction. Seed shall be covered a maximum 1/2 inch depth by light raking or other approved device.

3.3.1.2 Drill Seeding

Seed shall be uniformly drilled to a maximum 1/2 inch depth using seeders appropriate for the type of seeds spread. Row markers shall be used with the drill seeder. Seed shall be uniformly sown in two passes, each at right angles to the other. Final pass shall be parallel to the finished contours.

3.3.1.3 Rolling

The entire area shall be firmed with a roller not exceeding 90 pounds per foot roller width. Slopes over a maximum 3-horizontal-to-1 vertical shall not be rolled. Areas seeded with seed drills equipped with rollers shall not be rolled.

3.3.2 Mulching

Mulching shall be completed within 24 hours of having the surfaces seeded.

3.3.2.1 Hydromulching

Wood cellulose fiber mulch shall be applied to the seeded surfaces at the rate of no less than 2500 lbs per acre. Tackifier shall be applied at the rate of 120 pounds per acre. Mulch, tackifier and water shall be thoroughly mixed to produce a homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydromulched area shall not be rolled. Hydromulching is not required in areas to receive erosion control blankets.

3.3.3 Watering Seed

Watering shall not be required.

3.4 SURFACE EROSION CONTROL

3.4.1 Surface Erosion Control Material

Surface erosion control material shall be installed within 24 hours of seeding, in accordance with manufacturer's instructions. Soil erosion control blankets shall be placed on all seeded surfaces shown on the plans with slopes 3 horizontal to 1 vertical or steeper, and all swales concentrating water leading to culvets, inlets and surfaces around culvert entrances and exits that are not indicated to have riprap. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade.

3.4.2 Temporary Seeding

When directed during contract delays affecting the seeding operation or

when a quick cover is required to prevent surface erosion, the areas designated shall be seeded in accordance with temporary seed species listed under Paragraph SEED.

3.4.2.1 Soil Amendments

When soil amendments have not been applied to the area, the quantity of 1/2 of the required soil amendments shall be applied and the area tilled in accordance with paragraph SITE PREPARATION.

3.4.2.2 Remaining Soil Amendments

The remaining soil amendments shall be applied in accordance with the paragraph Tillage when the surface is prepared for installing seed.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.6 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, when weeds comprise more than 5% of the seeded area, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.6.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.6.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately. A pesticide plan shall be submitted.

3.7 RESTORATION AND CLEAN UP

3.7.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.7.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.8 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.9 SEED ESTABLISHMENT PERIOD

3.9.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall end 6 months after the last day of the seeding operation. Written calendar time period shall be furnished for the seed establishment period. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.9.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health when the grass plants are a minimum 6 inches high.

3.9.2.1 Seeded Areas

A satisfactory stand of grass plants from the seeding operation shall be defined as consisting of 40 grass plants per square foot. Bare spots shall be a maximum 6 inches square. The total bare spots shall be a maximum 5 percent of the total seeded area.

3.9.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include mowing, eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic.

3.9.3.1 Mowing and Weed Control

Mowing is an integral portion of the establishment of seeded areas. Of particular importance is the control of weeds during the first year. Grass shall be mown to a minimum height of 5"- 6" when the height of the grass or weeds obtain a height of 10"-12".

3.9.3.2 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.9.3.3 Repair or Reinstall

Unsatisfactory stand of grass plants and mulch shall be repaired or

reseeded, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION within 30 days of notification from the Contracting Officer.

3.9.3.4 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02930

TREES

06/98

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SOURCE INSPECTIONS
1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING
1.4.1 Delivery
1.4.1.1 Plant Material Identification
1.4.1.2 Protection During Delivery
1.4.1.3 Delivered Topsoil
1.4.1.4 Soil Amendments
1.4.1.5 Pesticide Material
1.4.2 Inspection
1.4.3 Storage
1.4.3.1 Plant Material Storage
1.4.3.2 Other Material Storage
1.4.4 Handling
1.4.5 Time Limitation
1.5 WARRANTY

PART 2 PRODUCTS

2.1 PLANT MATERIAL
2.1.1 Plant Material Classification
2.1.2 Plant Schedule
2.1.3 Substitutions
2.1.4 Quality
2.1.5 Growing Conditions
2.1.6 Method of Shipment to Maintain Health of Root System
2.1.6.1 Balled and Burlapped (BB) Plant Material
2.1.7 Growth of Trunk and Crown
2.1.7.1 Deciduous Trees
2.1.8 Plant Material Size
2.1.9 Plant Material Measurement
2.2 TOPSOIL
2.3 SOIL AMENDMENTS
2.3.1 Organic Material
2.3.1.1 Peat
2.3.1.2 Recycled Compost
2.4 MULCH
2.4.1 ORGANIC MULCH
2.4.1.1 Shredded Bark
2.4.1.2 Wood Chips and Ground Bark
2.5 GEOTEXTILE
2.6 WOOD STAKING MATERIAL
2.6.1 Bracing Stake

2.6.2 Wood Ground Stakes
2.7 METAL STAKING AND GUYING MATERIAL
2.7.1 Bracing Stakes
2.7.2 Metal Ground Stakes
2.7.3 Guying Material
2.7.4 Turnbuckle
2.8 PLASTIC GUYING MATERIAL
2.8.1 Chafing Guard
2.9 RUBBER GUYING MATERIAL
2.10 FLAG
2.11 MYCORRHIZAL FUNGI INOCULUM
2.12 WATER
2.13 PESTICIDE

PART 3 EXECUTION

3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS
3.1.1 Deciduous Plant Material Time
3.1.2 Plant Material Conditions
3.1.3 Tests
3.1.3.1 Percolation Test
3.2 SITE PREPARATION
3.2.1 Finished Grade, Topsoil and Underground Utilities
3.2.2 Layout
3.2.3 Protecting Existing Vegetation
3.3 EXCAVATION
3.3.1 Obstructions Below Ground
3.3.2 Plant Pits
3.4 INSTALLATION
3.4.1 Setting Plant Material
3.4.2 Backfill Soil Mixture
3.4.3 Adding Mycorrhizal Fungi Inoculum
3.4.4 Backfill Procedure
3.4.4.1 Balled and Burlapped
3.4.4.2 Earth Berm
3.4.5 Watering
3.4.6 Staking and Guying
3.4.6.1 Three Bracing Stakes
3.4.7 Flags
3.5 FINISHING
3.5.1 Plant Material
3.5.2 Placing Mulch
3.5.3 Pruning
3.5.4 Tree Wrapping
3.6 MAINTENANCE DURING PLANTING OPERATION
3.7 APPLICATION OF PESTICIDE
3.7.1 Technical Representative
3.7.2 Application
3.8 RESTORATION AND CLEAN UP
3.8.1 Restoration
3.8.2 Clean Up
3.9 PLANT ESTABLISHMENT PERIOD
3.9.1 Commencement
3.9.2 Maintenance During Establishment Period
3.9.2.1 Watering Plant Material
3.9.2.2 Weeding
3.9.2.3 Pesticide Treatment
3.9.2.4 Plant Pit Settling
3.9.2.5 Maintenance Record

3.9.3 Unhealthy Plant Material
3.9.4 Replacement Plant Material
3.9.5 Maintenance Instructions

-- End of Section Table of Contents --

SECTION 02930

TREES
06/98

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (ANLA)

ANLA ANSI/ANLA Z60.1	(1996) Nursery Stock

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A300	(1995) Tree Care Operations - Trees, Shrubs and other Woody Plant Maintenance

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes

1.2 SUBMITTALS

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

SD-01 Data

Geotextile;

Manufacturer's literature including physical characteristics, application and installation instructions for geotextile.

SD-07 Schedules

Equipment;

A listing of equipment to be used for the planting operation.

SD-08 Statements

Delivery;

Delivery schedule.

Finished Grade, Topsoil and Underground Utilities;

Finished grade status; location of underground utilities and facilities; and availability of topsoil from the stripping and stock piling operation.

SD-13 Certificates

Plant Material;
Topsoil;
Organic Material;
Soil Conditioner;
Organic Mulch;
Mycorrhizal Fungi Inoculum;
Pesticide; G-AO

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following.

a. Plant Material: Classification, botanical name, common name, size, quantity by species, and location where grown.

b. Topsoil: Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

e. Organic Material: Composition and source.

f. Soil Conditioner: Composition and source.

g. Organic Mulch: Composition, source.

h. Mycorrhizal Fungi Inoculum: Plant material treated.

i. Pesticide. EPA registration number and registered uses.

SD-14 Samples

Delivered Topsoil; .

Samples taken from several locations at the source.

Soil Amendments; .

A 10 pound sample.

Mulch; .

A 10 pound sample.

Geotextile; .

A 6 inch square sample.

SD-18 Records

Plant Establishment Period; .

Calendar time period for the plant establishment period. When there is more than one establishment period, the boundaries of the planted areas covered for each period shall be described.

Maintenance Record; .

Maintenance work performed, quantity of plant losses, and replacements; and diagnosis of unhealthy plant material.

Application of Pesticide; G-AO.

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

SD-19 Operation and Maintenance Manuals

Maintenance Instructions; .

Instruction for year-round care of installed plant material.

1.3 SOURCE INSPECTIONS

The nursery or source of plant material and the source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Plant Material Identification

Plant material shall be identified with attached, durable, waterproof labels and weather-resistant ink, stating the correct botanical plant name and size.

1.4.1.2 Protection During Delivery

Plant material shall be protected during delivery to prevent desiccation and damage to the branches, trunk, root system, or earth ball. Branches shall be protected by tying-in. Exposed branches shall be covered during transport.

1.4.1.3 Delivered Topsoil

Prior to the delivery of any topsoil, the availability of topsoil shall be verified in paragraph TOPSOIL.

1.4.1.4 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.1.5 Pesticide Material

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses.

1.4.2 Inspection

Plant material shall be well shaped, vigorous and healthy with a healthy, well branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion. Plant material shall be checked for unauthorized substitution and to establish nursery grown status. Plant material showing desiccation, abrasion, sun-scald injury, disfigurement, or unauthorized substitution shall be rejected. The plant material shall exhibit typical form of branch to height ratio; and meet the caliper and height measurements specified. Plant material that measures less than specified, or has been poled, topped off or headed back, shall be rejected. Plant material with broken or cracked balls; or broken containers shall be rejected. Other materials shall be inspected for compliance with paragraph PRODUCTS. Open soil amendment containers or wet soil amendments shall be rejected. Topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material larger than 1-1/2 inch diameter shall be rejected. Topsoil that contains viable plant material and plant parts shall be rejected. Unacceptable material shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Plant Material Storage

Plant material not installed on the day of arrival at the site shall be stored and protected in designated areas. Plant material shall not be stored longer than 30 days. Plant material shall be protected from direct exposure to wind and sun. Bare-root plant material shall be heeled-in. All plant material shall be kept in a moist condition by watering with a fine mist spray until installed.

1.4.3.2 Other Material Storage

Storage of other material shall be in designated areas. Soil amendments shall be stored in dry locations and away from contaminants.

1.4.4 Handling

Plant material shall not be injured in handling. Cracking or breaking the earth ball of balled and burlapped plant material shall be avoided. Plant material shall not be handled by the trunk or stems. Materials shall not be dropped from vehicles.

1.4.5 Time Limitation

The time limitation from digging to installing plant material shall be a maximum 90 days. The time limitation between installing the plant material and placing the mulch shall be a maximum 24 hours.

1.5 WARRANTY

Furnished plant material shall have a warranty for plant growth to be in a vigorous growing condition for a minimum 12 month period. A minimum 12 month calendar time period for the warranty of plant growth shall be provided regardless of the contract time period. When plant material is

determined to be unhealthy in accordance with paragraph PLANT ESTABLISHMENT PERIOD, it shall be replaced once under this warranty.

PART 2 PRODUCTS

2.1 PLANT MATERIAL

2.1.1 Plant Material Classification

The plant material shall be nursery grown stock conforming to ANLA ANSI/ANLA Z60.1 and shall be the species specified.

2.1.2 Plant Schedule

The plant schedule shall provide botanical names as included in one or more of the publications listed under "Nomenclature" in ANLA ANSI/ANLA Z60.1.

2.1.3 Substitutions

Substitutions will not be permitted without written request and approval from the Contracting Officer. Execution of a contract shall be evidence that the Contractor has made successful procurement arrangements for all plant materials as specified.

2.1.4 Quality

Well shaped, well grown, vigorous plant material having healthy and well branched root systems in accordance with ANLA ANSI/ANLA Z60.1 shall be provided. Plant material shall be provided free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plant material shall be free of shock or damage to branches, trunk, or root systems, which may occur from the digging and preparation for shipment, method of shipment, or shipment. Plant quality is determined by the growing conditions; method of shipment to maintain health of the root system; and growth of the trunk and crown as follows.

2.1.5 Growing Conditions

Plant material shall be native to or well-suited to the growing conditions of the project site. Plant material shall be State of Colorado grown under climatic conditions similar to those at the project site. Imported plants will have been grown in the state of Colorado for a minimum or 12 months.

2.1.6 Method of Shipment to Maintain Health of Root System

2.1.6.1 Balled and Burlapped (BB) Plant Material

Ball size and ratio shall be in accordance with ANLA ANSI/ANLA Z60.1. The ball shall be of a diameter and depth to encompass enough fibrous and feeding root system necessary for the full recovery of the plant. The plant stem or trunk shall be centered in the ball. All roots shall be clean cut at the ball surface. Roots shall not be pulled from the ground. Before shipment the root ball shall be dipped in gels containing mycorrhizal fungi inoculum. The root ball shall be completely wrapped with burlap or other suitable material and securely laced with biodegradable twine.

2.1.7 Growth of Trunk and Crown

2.1.7.1 Deciduous Trees

A height to caliper relationship shall be provided in accordance with ANLA ANSI/ANLA Z60.1. Height of branching shall bear a relationship to the size and species of tree specified and with the crown in good balance with the trunk. The trees shall not be "poled" or the leader removed.

a. Single stem: The trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.

2.1.8 Plant Material Size

Plant material shall be furnished in sizes indicated. Plant material larger in size than specified may be provided at no additional cost to the Government.

2.1.9 Plant Material Measurement

Plant material measurements shall be in accordance with ANLA ANSI/ANLA Z60.1.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the plant material specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of organic material and soil conditioners meeting the following requirements. Vermiculite is not recommended.

2.3.1 Organic Material

Organic material shall consist of either peat, decomposed wood derivatives, recycled compost.

2.3.1.1 Peat

Peat shall be derived from Sphagnum peat and contain at least 95 percent organic matter determined by an oven dry weight basis and shall have a pH of 4 to 6.5.

2.3.1.2 Recycled Compost

Compost shall be a well decomposed, stable, weed free organic matter source. It shall be derived yard trimmings. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35-55 percent by weight. The material shall not contain more than 1 percent or less by weight of man-made foreign matter. Compost shall be cleaned of

plastic materials larger than 2 inches in length.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 ORGANIC MULCH

Organic mulch materials shall consist of shredded bark or wood chips. Organic mulch shall be used for all individually planted trees in field areas.

2.4.1.1 Shredded Bark

Shredded cedar wood material shall be commercially available and treated to a rust color to retard the growth of mold and fungi. Shredded cedar mulch shall range in size from 12mm to 40mm long and 10mm wide. Material shall not include leaves or needles.

2.4.1.2 Wood Chips and Ground Bark

Locally chipped or ground material shall be treated to retard the growth of mold and fungi. Gradation: A maximum 2 inch wide by 4 inch long.

2.5 GEOTEXTILE

Geotextile shall be landscape fabric specifically made for underlaying mulch material and made specifically for use as a fabric around plant material. Nominal weight shall be a minimum 4 ounces per square yard. Permeability rate shall be a minimum 0.04 inch per second.

2.6 WOOD STAKING MATERIAL

Wood stakes shall be hardwood or fir; rough sawn; free from knots, rot, cross grain, or other defects that would impair their strength.

2.6.1 Bracing Stake

Wood bracing stakes shall be a minimum 2 x 2 inch square and a minimum 8 feet long with a point at one end. Stake shall be set without damaging rootball.

2.6.2 Wood Ground Stakes

Wood ground stakes shall be a minimum of 2 x 2 inch square and a minimum 3 feet long with a point at one end.

2.7 METAL STAKING AND GUYING MATERIAL

Metal shall be steel or aluminum made for holding plant material in place.

2.7.1 Bracing Stakes

Metal bracing stakes shall be a minimum 1 inch diameter and a minimum 8 feet long. Stake shall be set without damaging rootball.

2.7.2 Metal Ground Stakes

Metal ground stakes shall be a minimum 1/2 inch diameter and a minimum 3 feet long.

2.7.3 Guying Material

Metal guying material shall be a minimum 12 gauge wire. Multi-strand cable shall be woven wire. Guying material tensile strength shall conform to the size of tree to be held firmly in place.

2.7.4 Turnbuckle

Metal turnbuckles shall be galvanized or cadmium-plated steel, and shall be a minimum 3 inches long with closed screw eyes on each end. Screw thread tensile strength shall conform to the size of tree to be held firmly in place.

2.8 PLASTIC GUYING MATERIAL

Plastic shall not be used for deadmen.

2.8.1 Chafing Guard

Plastic chafing guards shall be used to protect tree trunks and branches when metal is used as guying material. The material shall be the same color throughout the project site. Length shall be a minimum 1.5 times the circumference of the plant trunk at its base.

2.9 RUBBER GUYING MATERIAL

Rubber chafing guards, consisting of recycled material, shall be used to protect tree trunks and branches when metal guying material is applied. The material shall be the same color throughout the project. Length shall be a minimum 1.5 times the circumference of the plant trunk at its base.

2.10 FLAG

Plastic flag material shall be used on guying material. It shall be a minimum 6 inches long. Tape color shall be consistent and visually complimentary to the entire project area. The tape color shall meet pedestrian visual safety requirements for day and night.

2.11 MYCORRHIZAL FUNGI INOCULUM

Mycorrhizal fungi inoculum shall be composed of multiple-fungus inoculum as recommended by the manufacturer for the plant material specified.

2.12 WATER

Unless otherwise directed, water shall be the responsibility of the Contractor. Water shall not contain elements toxic to plant life.

2.13 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

PART 3 EXECUTION

3.1 INSTALLING PLANT MATERIAL TIME AND CONDITIONS

3.1.1 Deciduous Plant Material Time

Deciduous plant material shall be installed from October 1 to May 1.

3.1.2 Plant Material Conditions

Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval.

3.1.3 Tests

3.1.3.1 Percolation Test

Test for percolation shall be done to determine positive drainage of plant pits and beds. A positive percolation shall consist of a minimum 1 inch per 3 hours; when a negative percolation test occurs, a shop drawing shall be submitted indicating the corrective measures.

3.2 SITE PREPARATION

3.2.1 Finished Grade, Topsoil and Underground Utilities

The Contractor shall verify that finished grades are as indicated on drawings, and that the placing of topsoil, the smooth grading, and the compaction requirements have been completed pior to the commencement of the planting operation. The location of underground utilities and facilities in the area of the planting operation shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.2.2 Layout

Plant material locations and bed outlines shall be staked on the project site before any excavation is made. Plant material locations may be adjusted to meet field conditions.

3.2.3 Protecting Existing Vegetation

Existing trees indicated on the plans to be peserved shall be barricaded along the dripline to protect them during planting operations.

3.3 EXCAVATION

3.3.1 Obstructions Below Ground

When obstructions below ground affect the work, shop drawings showing proposed adjustments to plant material location, type of plant and planting method shall be submitted for approval.

3.3.2 Plant Pits

Plant pits for ball and burlapped or container plant material shall be dug to a depth equal to the height of the root ball as measured from the base of the ball to the base of the plant trunk. Plant pits shall be dug a minimum 50 percent wider than the ball or root system to allow for root expansion. The pit shall be constructed with sides sloping towards the base as a cone, to encourage well aerated soil to be available to the root system for favorable root growth. Cylindrical pits with vertical sides shall not be used.

3.4 INSTALLATION

3.4.1 Setting Plant Material

Plant material shall be set plumb and held in position until sufficient soil has been firmly placed around root system or ball. In relation to the surrounding grade, the plant material shall be set even with the grade at which it was grown.

3.4.2 Backfill Soil Mixture

The backfill soil mixture shall be a mixture of excavated soil and soil amendments suitable for the plant material specified. Mix shall include a minimum of 1/2 cubic foot of organic material for trees.

3.4.3 Adding Mycorrhizal Fungi Inoculum

Mycorrhizal fungi inoculum shall be added as recommended by the manufacturer for the plant material specified.

3.4.4 Backfill Procedure

Prior to backfilling, all metal, wood, synthetic products, or treated burlap devices shall be removed from the ball or root system avoiding damage to the root system. The backfill procedure shall remove air pockets from around the root system. Additional requirements are as follows.

3.4.4.1 Balled and Burlapped

Biodegradable burlap and tying material shall be carefully opened and folded back from the top a minimum 1/3 depth from the top of the root ball. Backfill mixture shall be added to the plant pit in 6 inch layers with each layer tamped.

3.4.4.2 Earth Berm

An earth berm, for individually planted trees in non-irrigated turf areas consisting of backfill soil mixture, shall be formed with a minimum 4 inch height around the edge of the plant pit to aid in water retention and to provide soil for settling adjustments.

3.4.5 Watering

Plant pits shall be watered once during backfilling when half the backfill has been installed and immediately after backfilling is completed until completely saturated.

3.4.6 Staking and Guying

Staking will be required when trees are unstable or will not remain set due

to their size, shape, or exposure to high wind velocity.

3.4.6.1 Three Bracing Stakes

Deciduous trees shall be firmly anchored in place with 3 bracing stakes placed equally around the tree. Bracing stakes shall be driven vertically into firm ground and shall not injure the ball or root system. The tree shall be held firmly between the stakes with a double strand of guying material. The guying material shall be firmly anchored at a minimum 1/2 tree height and shall prevent girdling. Chafing guards shall be used when metal is the guying material.

3.4.7 Flags

A flag shall be securely fastened to each guy line equidistant between the tree and the stake. The flag shall be visible to pedestrians.

3.5 FINISHING

3.5.1 Plant Material

Prior to placing mulch, the installed area shall have earthen saucers prepared around the individually planted trees in seeded areas to provide a clear division line between the planted area and the adjacent turf area as indicated. The installed area shall be raked and smoothed while maintaining the earth berms.

3.5.2 Placing Mulch

The placement of mulch shall occur a maximum 48 hours after planting. Mulch, used to reduce soil water loss, regulate soil temperature and prevent weed growth, shall be spread to cover the installed area with a minimum 4 inch uniform thickness. Mulch shall be kept off buildings, sidewalks and other facilities. Shredded Organic mulch shall be used for individually planted trees in seeded areas.

3.5.3 Pruning

Pruning shall be accomplished by trained and experienced personnel. The pruning of trees and palms shall be in accordance with ANSI A300. Only dead or broken material shall be pruned from installed plants. The typical growth habit of individual plant material shall be retained. Clean cuts shall be made flush with the parent trunk. Improper cuts, stubs, dead and broken branches shall be removed. "Headback" cuts at right angles to the line of growth will not be permitted. Trees shall not be poled or the leader removed, nor shall the leader be pruned or "topped off".

3.5.4 Tree Wrapping

Wrapping material shall be horticulturally approved waterproof wrapping paper. Wrapping shall be applied from the base of the tree to the second branch and secured with tape. Wrapping shall be done in the fall months prior to freeze and removed in the spring. Wrapping shall not remain on any trees throughout the summer months.

3.6 MAINTENANCE DURING PLANTING OPERATION

Installed plant material shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant

is installed to prevent desiccation and shall continue until the plant establishment period commences. Installed areas shall be kept free of weeds, grass, and other undesired vegetation. The maintenance includes maintaining the mulch, watering, and adjusting settling, and maintaining staking materials. All plant tags shall be removed from plants and all staking materials removed after one growing season.

3.7 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.7.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.7.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.8 RESTORATION AND CLEAN UP

3.8.1 Restoration

Turf areas, pavements and facilities that have been damaged from the planting operation shall be restored to original condition at the Contractor's expense.

3.8.2 Clean Up

Excess and waste material shall be removed from the installed area and shall be disposed offsite. Adjacent paved areas shall be cleared.

3.9 PLANT ESTABLISHMENT PERIOD

3.9.1 Commencement

Upon completion of the last day of the planting operation, the plant establishment period for maintaining installed plant material in a healthy growing condition shall commence and shall be in effect for the remaining contract time period, not to exceed 12 months. Written calendar time period shall be furnished for the plant establishment period. When there is more than one plant establishment period, the boundaries of the planted area covered for each period shall be described. The plant establishment period shall be coordinated with Sections 02921 SEEDING. The plant establishment period shall be modified for inclement weather shut down

periods, or for separate completion dates for areas.

3.9.2 Maintenance During Establishment Period

Maintenance of plant material shall include straightening plant material, straightening stakes; tightening guying material; correcting girdling; supplementing mulch; pruning dead or broken branch tips; maintaining plant material labels; watering; eradicating weeds, insects and disease; post-fertilization; and removing and replacing unhealthy plants.

3.9.2.1 Watering Plant Material

The plant material shall be watered as necessary to prevent desiccation and to maintain a satisfactory supply of moisture within the root zone. An adequate supply of moisture is estimated to be the equivalent of 1 inch absorbed water per week, delivered in the form of rain or augmented by watering. Run-off, puddling and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or existing plant material shall be prevented.

3.9.2.2 Weeding

Grass and weeds in the installed areas shall not be allowed to reach a maximum 3 inches height before being completely removed, including the root system.

3.9.2.3 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.9.2.4 Plant Pit Settling

When settling occurs to the backfill soil mixture, additional backfill soil shall be added to the plant pit until the backfill level is equal to the surrounding grade. Serious settling that affects the setting of the plant in relation to the maximum depth at which it was grown requires replanting in accordance with paragraph INSTALLATION. The earth berm shall be maintained.

3.9.2.5 Maintenance Record

A record shall be furnished describing the maintenance work performed, the quantity of plant losses, diagnosis of the plant loss, and the quantity of replacements made on each site visit.

3.9.3 Unhealthy Plant Material

A tree shall be considered unhealthy or dead when the main leader has died back, or up to a maximum 25 percent of the crown has died. This condition shall be determined by scraping on a branch an area 1/16 inch square, maximum, to determine if there is a green cambium layer below the bark. The Contractor shall determine the cause for unhealthy plant material and shall provide recommendations for replacement. Unhealthy or dead plant material shall be removed within 30 days of notification of the Contracting Officer and shall be replaced as soon as seasonal conditions permit.

3.9.4 Replacement Plant Material

Unless otherwise directed, plant material shall be provided for replacement in accordance with paragraph PLANT MATERIAL. Replacement plant material shall be installed in accordance with paragraph INSTALLATION, and recommendations in paragraph PLANT ESTABLISHMENT PERIOD. Plant material shall be replaced in accordance with paragraph WARRANTY.

3.9.5 Maintenance Instructions

Written instructions shall be furnished containing drawings and other necessary information for year-round care of the installed plant material; including, when and where maintenance should occur, and the procedures for plant material replacement,.

-- End of Section --

SECTION 03100

STRUCTURAL CONCRETE FORMWORK
11/88; Omaha Update: 04/02

PART 1 GENERAL

1.1 REFERENCES

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

ACI INTERNATIONAL (ACI)

\-ACI 347R-\ (1994)Guide to Formwork for Concrete

AMERICAN HARDBOARD ASSOCIATION (AHA)

\-AHA A135.4-\ (1995) Basic Hardboard

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM C 578-\ (1995) Rigid, Cellular Polystyrene Thermal Insulation

DEPARTMENT OF COMMERCE (DOC)

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

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

Concrete Formwork;

Manufacturer's data including literature describing form materials, accessories, and form releasing agents.

Architectural Formwork; G-DO.

Manufacturer's data including literature describing form materials, accessories, and form releasing agents.

SD-03 Product Data

Design; G-DO

Design analysis and calculations for form design and methodology used in the design.

Concrete Formwork; G-DO

Drawings showing details of formwork including, dimensions of joints, supports, studding and shoring, and sequence of form and shoring removal.

Form Releasing Agents;

Manufacturer's recommendation on method and rate of application of form releasing agents.

1.3 *DESIGN*
Formwork shall be designed in accordance with methodology of \-ACI 347R-\ for anticipated loads, lateral pressures, and stresses. Forms shall be capable of producing a surface which meets the requirements of the class of finish specified in Section \=03301=\ CAST-IN-PLACE STRUCTURAL CONCRETE. Forms shall be capable of withstanding the pressures resulting from placement and vibration of concrete.

PART 2 PRODUCTS

2.1 FORM MATERIALS

2.1.1 Forms For Class B Finish
Forms for Class B finished surfaces shall be plywood panels conforming to \-DOC PS 1-\, Grade B-B concrete form panels, Class I or II. Other form materials or liners may be used provided the smoothness and appearance of concrete produced will be equivalent to that produced by the plywood concrete form panels. Surfaces to receive a Class B finish include all surfaces except those specified to receive Class D.

2.1.2 Forms For Class D Finish
Forms for Class D finished surfaces, except where concrete is placed against earth, shall be wood or steel or other approved concrete form material. Surfaces to receive a Class D finish include all surfaces against which backfill will be placed.

2.1.3 Architectural Forms For Upstream of New Kipling
Forms used for the exposed surfaces of the channel walls shall be an architectural surface treatment generated by the use of a high quality elastomeric form liner such as offered by Scott System, Inc., Graylastic, or equal. The exposed finished should give the appearance of a rock wall. The contractor shall submit samples of the pattern for approval by the City of Arvada prior to forming the walls.

2.1.4 <u>Not Used</u>

2.1.5 Form Ties
Form ties shall be factory-fabricated metal ties, shall be of the removable or internal disconnecting or snap-off type, and shall be of a design that will not permit form deflection and will not spall concrete upon removal. Solid backing shall be provided for each tie. Except where removable tie rods are used, ties shall not leave holes in the concrete surface less than 1/4 inch nor more than 1 inch deep and not more than 1 inch in diameter. Removable tie rods shall be not more than 1-1/2 inches in diameter.

2.1.6 *Form Releasing Agents*
Form releasing agents shall be commercial formulations that will not bond with, stain or adversely affect concrete surfaces. Agents shall 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

3.1 INSTALLATION

3.1.1 Formwork

Forms shall be mortar tight, properly aligned and adequately supported to produce concrete surfaces meeting the surface requirements specified in Section \=03300=\ CAST-IN-PLACE STRUCTURAL CONCRETE and conforming to construction tolerance given in TABLE 1. Where concrete surfaces are to have a Class B finish, joints in form panels shall be arranged as approved. 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 alignment of the surface and to prevent leakage of mortar. Forms shall not be reused if there is any evidence of surface wear and tear or defects which would impair the quality of the surface. Surfaces of forms to be reused shall be cleaned of mortar from previous concreting and of all other foreign material before reuse. Form ties that are to be completely withdrawn shall be coated with a nonstaining bond breaker.

3.2 CHAMFERING

Except as otherwise shown, external corners that will be exposed shall be chamfered, beveled, or rounded by moldings placed in the forms.

3.3 COATING

Forms for Class B finished surfaces shall be coated with a form releasing 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 Class C and D finished surfaces 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.

3.4 REMOVAL OF FORMS

Forms shall be removed in a manner that will prevent injury to the concrete and ensure the complete safety of the structure. Formwork for columns, walls, side of beams and other parts not supporting the weight of concrete may be removed when the concrete has attained sufficient strength to resist damage from the removal operation but not before at least 24 hours has elapsed since concrete placement. Supporting forms and shores shall not be removed from beams, floors and walls until the structural units are strong enough to carry their own weight and any other construction or natural loads. In no case will supporting forms or shores be removed before the concrete strength has reached 70 percent of design strengths as determined by field cured cylinders or other approved methods. This strength shall be demonstrated by job-cured test specimens, and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of forming and shoring system. The job-cured test specimens for form removal purposes shall be provided in numbers as directed and shall be in addition to those required for concrete quality control. The specimens shall be removed from molds at the age of 24 hours and shall receive, insofar as possible, the same curing and protection as the structures they represent.

TABLE 1

TOLERANCES FOR FORMED SURFACES

1. Variations from the plumb:	In any 10 feet of length -----	1/4 inch
a. In the lines and surfaces	Maximum for entire length -----	1 inch

of columns, piers, walls and in arises	
b. For exposed corner columns, control-joint grooves, and other conspicuous lines	In any 20 feet of length ----- 1/4 inch Maximum for entire length ---- 1/2 inch
2. Variation from the level or from the grades indicated on the drawings	In any 10 feet of length ----- 1/4 inch In any bay or in any 20 feet of length ---------- 3/8 inch
a. In slab soffits, ceilings, beam soffits, and in arises, measured before removal of supporting shores	Maximum for entire length ---- 3/4 inch
b. In exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines	In any bay or in any 20 feet of length ---------- 1/4 inch Maximum for entire length ---- 1/2 inch
3. Variation of the linear building lines from established position in plan	In any 20 feet ---------- 1/2 inch Maximum ---------- 1 inch
4. Variation of distance between walls, columns, partitions	1/4 inch per 10 feet of distance, but not more than 1/2 inch in any one bay, and not more than 1 inch total variation
5. Variation in the sizes and locations of sleeves, floor openings, and wall opening	Minus ---------- 1/4 inch Plus ---------- 1/2 inch
6. Variation in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls	Minus ---------- 1/4 inch Plus ---------- 1/2 inch
7. 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 footing width in the direction of misplacement but not more than ---------- 2 inches
c. Reduction in thickness	Minus ---------- 5 percent of specified thickness

SECTION 03200

CONCRETE REINFORCEMENT
11/88; Omaha Update 04/02

PART 1 GENERAL

1.1 REFERENCES

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

ACI INTERNATIONAL (ACI)

\-ACI 318/318R-\	(1999) Building Code Requirements for Structural Concrete and Commentary

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM A 53-\	(1999) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
\-ASTM A 184-\	(1996) Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
\-ASTM A 185-\	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
\-ASTM A 497-\	(1997) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
\-ASTM A 615-\	(1996b) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
\-ASTM A 675-\	(1990a; R 1995e1) Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties

AMERICAN WELDING SOCIETY (AWS)

\-AWS D1.4-\	(1998) Structural Welding Code - Reinforcing Steel

CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

\-CRSI MSP-1-\	(1996) Manual of Standard Practice

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. When used, the letters following the “G” designate the office that will review the submittal for the Government. The following shall be submitted in accordance with specification section \=01330=\ SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

Concrete Reinforcement System; G-DO

Detail drawings showing reinforcing steel placement, schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes and spacing.

SD-07 Certificates

Qualifications;

A list of names of qualified welders.

SD-06 Test Reports

Reinforcing Steel;

Certified copies of mill reports attesting that the reinforcing steel furnished meets the requirements specified, prior to the installation of reinforcing steel.

1.3 \+*QUALIFICATIONS*\+
Welders shall be qualified in accordance with \-AWS D1.4-\. Qualification test shall be performed at the worksite and the Contractor shall notify the Contracting Officer 24 hours prior to conducting tests. Special welding procedures and welders qualified by others may be accepted as permitted by \-AWS D1.4-\.

1.4 DELIVERY AND STORAGE
Reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports.

PART 2 PRODUCTS

2.1 NOT USED

2.2 FABRICATED BAR MATS
Fabricated bar mats shall conform to \-ASTM A 184-\.

2.3 *REINFORCING STEEL*
Reinforcing steel shall be deformed bars conforming to \-ASTM A 615-\ grades and sizes as indicated. Cold drawn wire used for spiral reinforcement shall conform to \-ASTM A 82-\.

2.4 WELDED WIRE FABRIC
Welded wire fabric shall conform to \-ASTM A 185-\ or \-ASTM A 497-\.

2.5 WIRE TIES
Wire ties shall be 16 gauge or heavier black annealed steel wire.

2.6 SUPPORTS
Bar supports for formed surfaces shall be designed and fabricated in accordance with \-CRSI MSP-1-\ and shall be steel or precast concrete blocks. Precast concrete blocks shall have wire ties and shall be not less than \ 4 inches square when supporting reinforcement on ground. Precast concrete block shall have compressive strength equal to that of the surrounding concrete. Where concrete formed surfaces will be exposed to weather or where surfaces are to be painted, steel supports within 1/2 inch of concrete surface shall be galvanized, plastic protected or of stainless steel. Concrete supports used in concrete exposed to view shall have the same color and texture as the finish surface. For slabs on grade, supports shall be precast concrete blocks, plastic coated steel fabricated

with bearing plates, or specifically designed wire-fabric supports fabricated of plastic.

PART 3 EXECUTION

3.1 REINFORCEMENT

Reinforcement shall be fabricated to shapes and dimensions shown and shall conform to the requirements of \-ACI 318/318R-\. Reinforcement shall be cold bent unless otherwise authorized. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Safety caps shall be placed on all exposed ends of vertical concrete reinforcement bars that pose a danger to life safety. Wire tie ends shall face away from the forms.

3.1.1 Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with \-ACI 318/318R-\ at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated. If bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

3.1.2 Splicing

Splices of reinforcement shall conform to \-ACI 318/318R-\ and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical or welded butt connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Splice lengths shall be as indicated on the drawings. Welding shall conform to \-AWS D1.4-\. Welded butt splices shall be full penetration butt welds. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 6 inches. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

3.2 WELDED-WIRE FABRIC

Welded-wire fabric shall be placed in slabs as indicated. Fabric placed in slabs on grade shall be continuous between expansion, construction, and contraction joints. Fabric placement at joints shall be as indicated. Lap splices shall be made in such a way that the overlapped area equals the distance between the outermost crosswires plus 2 inches. Laps shall be staggered to avoid continuous laps in either direction. Fabric shall be wired or clipped together at laps at intervals not to exceed 4 feet. Fabric shall be positioned by the use of supports.

SECTION 03250

EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
USED IN CONCRETE
07/95; Omaha Update: 04/02

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

\-AASHTO T 111-\	(1983; R 1996) Inorganic Matter or Ash in Bituminous Materials

AMERICAN HARDBOARD ASSOCIATION (AHA)

\-AHA A135.4-\	(1995) Basic Hardboard

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM A 109-\	(1998a) Steel, Strip, Carbon, Cold-Rolled
\-ASTM A 167-\	(1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
\-ASTM A 480-\	(1999b) General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
\-ASTM A 570-\	(1998) Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality
\-ASTM B 152-\	(1997a) Copper Sheet, Strip, Plate, and Rolled Bar
\-ASTM B 370-\	(1998) Copper Sheet and Strip for Building Construction
\-ASTM C 919-\	(1984; R 1998) Standard Practice for Use of Sealants in Acoustical Applications
\-ASTM C 920-\	(1998) Elastomeric Joint Sealants
\-ASTM D 4-\	(1986; R 1998) Bitumen Content
\-ASTM D 6-\	(1995) Loss on Heating of Oil and Asphaltic Compounds
\-ASTM D 412-\	(1998a) Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
\-ASTM D 471-\	(1998e1) Rubber Property - Effect of Liquids
\-ASTM D 1190-\	(1997) Concrete Joint Sealer, Hot-Poured Elastic Type

\-ASTM D 1191-\	(1984; R 1994e1) Test Methods for Concrete Joint Sealers
\-ASTM D 1751-\	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
\-ASTM D 1752-\	(1984; R 1996e1) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
\-ASTM D 1854-\	(1996) Specification for Jet-Fuel-Resistant Concrete Joint Sealer, Hot-Poured Elastic Type
\-ASTM D 1855-\	(1989) Test Method for Jet-Fuel Resistant Concrete Joint Sealer, Hot-Poured Elastic Type
\-ASTM D 2628-\	(1991; R 1998) Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
\-ASTM D 2835-\	(1989; R 1998) Lubricant for Installation of Preformed Compression Seals in Concrete Pavements
\-ASTM D 5249-\	(1995) Backer Material for Use With Cold and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints

CORPS OF ENGINEERS (COE)

\-COE CRD-C 513-\	(1974) Corps of Engineers Specifications for Rubber Waterstops
\-COE CRD-C 572-\	(1974) Corps of Engineers Specifications for Polyvinylchloride Waterstops

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having no designation are for information only. The following shall be submitted in accordance with Section \=01300=\ SUBMITTAL PROCEDURES:

SD-03 Product Data

Preformed Expansion Joint Filler; G-AO.

Sealant; G-AO

Waterstops; G-AO.

Manufacturer's literature, including safety data sheets, for preformed fillers and the lubricants used in their installation; field-molded sealants and primers (when required by sealant manufacturer); preformed compression seals; and waterstops.

SD-02 Shop Drawings

Waterstops; G-AO

Shop drawings and fabrication drawings provided by the manufacturer or prepared by the Contractor.

SD-08 Manufacturer’s Instructions

Preformed Expansion Joint Filler;

Sealant;

Waterstops;

Manufacturer's recommended instructions for installing preformed fillers, field-molded sealants; preformed compression seals; and waterstops; and for splicing non-metallic waterstops.

SD-07 Certificates

Preformed Expansion Joint Filler;

Sealant;

Waterstops;

Certificates of compliance stating that the joint filler and sealant materials and waterstops conform to the requirements specified.

SD-04 Samples

Preformed Compression Seals and Lubricants; G-AO.

Specimens identified to indicate the manufacturer, type of material, size and quantity of material, and shipment or lot represented. Each sample shall be a piece not less than 9 ft of 1 inch nominal width or wider seal or a piece not less than 12 ft of compression seal less than 1 inch nominal width. One quart of lubricant shall be provided.

Field-Molded Sealant and Primer; G-AO

One gallon of field-molded sealant and one quart of primer (when primer is recommended by the sealant manufacturer) identified to indicate manufacturer, type of material, quantity, and shipment or lot represented.

Non-metallic Waterstops and Splices; G-AO.

Specimens identified to indicate manufacturer, type of material, size, quantity of material, and shipment or lot represented. Each sample shall be a piece not less than 12 inch long cut from each 200 ft of finished waterstop furnished, but not less than a total of 4 ft of each type, size, and lot furnished. One splice sample of each size and type for every 50 splices made in the factory and every 10 splices made at the job site. The splice samples shall be made using straight run pieces with the splice located at the mid-length of the sample and finished as required for the installed waterstop. The total length of each splice shall be not less than 12 inches long.

1.3 DELIVERY AND STORAGE

Material delivered and placed in storage shall be stored off the ground and protected from moisture, dirt, and other contaminants. Sealants shall be delivered in the manufacturer's original unopened containers. Sealants whose shelf life has expired shall be removed from the site.

PART 2 PRODUCTS

2.1 CONTRACTION JOINT STRIPS
Contraction joint strips shall be 1/8 inch thick tempered hardboard conforming to \-AHA A135.4-\, Class 1. In lieu of hardboard strips, rigid polyvinylchloride (PVC) or high impact polystyrene (HIPS) insert strips specifically designed to induce controlled cracking in slabs on grade may be used. Such insert strips shall have removable top section.

2.2 *PREFORMED EXPANSION JOINT FILLER*\
Expansion joint filler shall be preformed material conforming to \-ASTM D 1751-\ or \-ASTM D 1752-\. Unless otherwise indicated, filler material shall be 3/8 inch thick and of a width applicable for the joint formed. Backer material, when required, shall conform to \-ASTM D 5249-\.

2.3 *SEALANT*\
Joint sealant shall conform to the following:

2.3.1 Preformed Polychloroprene Elastomeric Type
\-ASTM D 2628-\.

2.3.2 Lubricant for Preformed Compression Seals
\-ASTM D 2835-\.

2.3.3 NOT USED

2.3.4 Field Molded Type

\-ASTM C 920-\, Type M for horizontal joints or Type NS for vertical joints, Class 25, and Use NT. Bond breaker material shall be polyethylene tape, coated paper, metal foil or similar type materials. The back-up material shall be compressible, non-shrink, nonreactive with sealant, and non-absorptive material type such as extruded butyl or polychloroprene rubber.

2.4 WATERSTOPS
Intersection and change of direction waterstops shall be shop fabricated.

2.4.1 NOT USED

2.4.2 NOT USED

2.4.3 Non-Metallic
Non-metallic waterstops shall be manufactured from a prime virgin resin; reclaimed material is not acceptable. The compound shall contain plasticizers, stabilizers, and other additives to meet specified requirements. Rubber waterstops shall conform to \-COE CRD-C 513-\. Polyvinylchloride waterstops shall conform to \-COE CRD-C 572-\. Thermoplastic elastomeric rubber waterstops shall conform to \-ASTM D 471-\.

2.4.4 NOT USED

2.4.5 NOT USED

2.4.5.1 NOT USED

2.4.5.2 Adhesion Under Hydrostatic Pressure
The sealing compound shall not leak at the joints for a period of 24 hours under a vertical 6 foot head pressure. In a separate test, the sealing compound shall

not leak under a horizontal pressure of 10 psi which is reached by slowly applying increments of 2 psi every minute.

2.4.5.3 Sag of Flow Resistance
No sagging shall be detected when tested as follows: Fill a wooden form 1 inch wide and 6 inches long flush with sealing compound and place in an oven at 135 degrees F in a vertical position for 5 days.

2.4.5.4 Chemical Resistance
The sealing compound when immersed separately in a 5% solution of caustic potash, a 5% solution of hydrochloric acid, 5% solution of sulfuric acid and a saturated hydrogen sulfide solution for 30 days at ambient room temperature shall show no visible deterioration.

PART 3 EXECUTION

3.1 JOINTS
Joints shall be installed at locations indicated and as authorized.

3.1.1 Contraction Joints

Contraction joints may be constructed by inserting tempered hardboard strips or rigid PVC or HIPS insert strips into the plastic concrete using a steel parting bar, when necessary, or by cutting the concrete with a saw after concrete has set. Joints shall be approximately 1/8 inch wide and shall extend into the slab one-fourth the slab thickness, minimum, but not less than 1 inch.

3.1.1.1 Joint Strips
Strips shall be of the required dimensions and as long as practicable. After the first floating, the concrete shall be grooved with a tool at the joint locations. The strips shall be inserted in the groove and depressed until the top edge of the vertical surface is flush with the surface of the slab. The slab shall be floated and finished as specified. Working of the concrete adjacent to the joint shall be the minimum necessary to fill voids and consolidate the concrete. Where indicated, the top portion of the strip shall be sawed out after the curing period to form a recess for sealer. The removable section of PVC or HIPS strips shall be discarded and the insert left in place. Means shall be provided to insure true alignment of the strips is maintained during insertion.

3.1.1.2 Sawed Joints
Joint sawing shall be early enough to prevent uncontrolled cracking in the slab, but late enough that this can be accomplished without appreciable spalling. Concrete sawing machines shall be adequate in number and power, and with sufficient replacement blades to complete the sawing at the required rate. Joints shall be cut to true alignment and shall be cut in sequence of concrete placement. Sludge and cutting debris shall be removed.

3.1.2 Expansion Joints
Preformed expansion joint filler shall be used in expansion and isolation joints in slabs around columns and between slabs on grade and vertical surfaces where indicated. The filler shall extend the full slab depth, unless otherwise indicated. The edges of the joint shall be neatly finished with an edging tool of 1/8 inch radius, except where a resilient floor surface will be applied. Where the joint is to receive a sealant, the filler strips shall be installed at the proper level below the finished floor with a slightly tapered, dressed and oiled wood strip temporarily secured to the top thereof to form a recess to the size shown on the drawings. The wood strip shall be removed after the concrete has set. Contractor may opt to use a removable expansion filler cap designed and fabricated for this purpose in lieu of the wood strip. The groove shall be thoroughly cleaned of laitance, curing compound, foreign materials, protrusions

of hardened concrete, and any dust which shall be blown out of the groove with oil-free compressed air.

3.1.3 Joint Sealant
Sawed contraction joints and expansion joints in slabs shall be filled with joint sealant, unless otherwise shown. Joint surfaces shall be clean, dry, and free of oil or other foreign material which would adversely affect the bond between sealant and concrete. Joint sealant shall be applied as recommended by the manufacturer of the sealant.

3.1.3.1 Joints With Preformed Compression Seals
Compression seals shall be installed with equipment capable of installing joint seals to the prescribed depth without cutting, nicking, twisting, or otherwise distorting or damaging the seal or concrete and with no more than 5 percent stretching of the seal. The sides of the joint and, if necessary, the sides of the compression seal shall be covered with a coating of lubricant. Butt joints shall be coated with liberal applications of lubricant.

3.1.3.2 Joints With Field-Molded Sealant
Joints shall not be sealed when the sealant material, ambient air, or concrete temperature is less than 40 degrees F. When the sealants are meant to reduce the sound transmission characteristics of interior walls, ceilings, and floors the guidance provided in \-ASTM C 919-\ shall be followed. Joints requiring a bond breaker shall be coated with curing compound or with bituminous paint. 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.

3.2 WATERSTOPS, INSTALLATION AND SPLICES
Waterstops shall be installed at the locations shown to form a continuous water-tight diaphragm. Adequate provision shall be made to support and completely protect the waterstops during the progress of the work. Any waterstop punctured or damaged shall be repaired or replaced. Exposed waterstops shall be protected during application of form release agents to avoid being coated. Suitable guards shall be provided to protect exposed projecting edges and ends of partially embedded waterstops from damage when concrete placement has been discontinued. Splices shall be made by certified trained personnel using approved equipment and procedures.

3.2.1 NOT USED

3.2.2 NOT USED

3.2.3 Non-Metallic
Fittings shall be shop made using a machine specifically designed to mechanically weld the waterstop. A miter guide, proper fixturing (profile dependant), and portable power saw shall be used to miter cut the ends to be joined to ensure good alignment and contact between joined surfaces. The splicing of straight lengths shall be done by squaring the ends to be joined. Continuity of the characteristic features of the cross section of the waterstop (ribs, tabular center axis, protrusions, etc.) shall be maintained across the splice.

3.2.3.1 Rubber Waterstop
Splices shall be vulcanized or shall be made using cold bond adhesive as recommended by the manufacturer. Splices for TPE-R shall be as specified for PVC.

3.2.3.2 Polyvinyl Chloride Waterstop
Splices shall be made by heat sealing the adjacent waterstop edges together using a thermoplastic splicing iron utilizing a non-stick surface specifically designed

for waterstop welding. The correct temperature shall be used to sufficiently melt without charring the plastic. The spliced area, when cooled, shall show no signs of separation, holes, or other imperfections when bent by hand in as sharp an angle as possible.

3.2.3.3 Quality Assurance

Edge welding will not be permitted. Centerbulbs shall be compressed or closed when welding to non-centerbulb type. Waterstop splicing defects which are unacceptable include, but are not limited to the following: 1) Tensile strength less than 80 percent of parent section. 2) Free lap joints. 3) Misalignment of centerbulb, ribs, and end bulbs greater than 1/16 inch. 4) Misalignment which reduces waterstop cross section more than 15 percent. 5) Bond failure at joint deeper than 1/16 inch or 15 percent of material thickness. 6) Misalignment of waterstop splice resulting in misalignment of waterstop in excess of 1/2 inch in 10 feet. 7) Visible porosity in the weld area, including pin holes. 8) Charred or burnt material. 9) Bubbles or inadequate bonding. 10) Visible signs of splice separation when cooled splice is bent by hand at a sharp angle.

3.2.4 Non-Metallic Hydrophilic Waterstop Installation

Ends to be joined shall be miter cut with sharp knife or shears. The ends shall be adhered with cyanacryiate (super glue) adhesive. When joining hydrophilic type waterstop to PVC waterstop, the hydrophilic waterstop shall be positioned as shown on the drawings. A liberal amount of a single component hydrophilic sealant shall be applied to the junction to complete the transition.

3.2.5 Preformed Plastic Adhesive Installation

The installation of preformed plastic adhesive waterstops shall be a prime, peel, place and pour procedure. Joint surfaces shall be clean and dry before priming and just prior to placing the sealing strips. The end of each strip shall be spliced to the next strip with a 1 inch overlap; the overlap shall be pressed firmly to release trapped air. During damp or cold conditions the joint surface shall be flashed with a safe, direct flame to warm and dry the surface adequately; the sealing strips shall be dipped in warm water to soften the material to achieve maximum bond to the concrete surface.

3.3 CONSTRUCTION JOINTS

Construction joints are specified in Section \=03301=\ CAST-IN-PLACE STRUCTURAL CONCRETE except that construction joints coinciding with expansion and contraction joints shall be treated as expansion or contraction joints as applicable.

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03301

CAST-IN-PLACE STRUCTURAL CONCRETE

11/01

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 QUALIFICATIONS
1.4 FIELD TEST PANELS
1.5 SPECIAL REQUIREMENTS
1.6 GENERAL REQUIREMENTS
1.6.1 Strength Requirements and w/c Ratio
1.6.1.1 Strength Requirements
1.6.1.2 Water-Cement Ratio
1.6.2 Air Entrainment
1.6.3 Slump
1.6.4 Concrete Temperature
1.6.5 Size of Coarse Aggregate
1.7 MIXTURE PROPORTIONS
1.7.1 Proportioning Studies for Normal Weight Concrete
1.7.2 Proportioning Studies for Flexural Strength Concrete
1.7.3 Average Compressive Strength Required for Mixtures
1.7.3.1 Computations from Test Records
1.7.3.2 Computations without Previous Test Records
1.8 STORAGE OF MATERIALS
1.9 GOVERNMENT ASSURANCE INSPECTION AND TESTING
1.9.1 Fresh Concrete
1.9.2 Hardened Concrete
1.9.3 Inspection

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS
2.1.1 Portland Cement
2.1.2 High-Early-Strength Portland Cement
2.1.3 Pozzolan (Fly Ash)
2.1.4 Ground Granulated Blast-Furnace (GGBF) Slag
2.2 AGGREGATES
2.2.1 Fine Aggregate
2.2.2 Coarse Aggregate
2.3 CHEMICAL ADMIXTURES
2.3.1 Air-Entraining Admixture
2.3.2 Accelerating Admixture
2.3.3 Water-Reducing or Retarding Admixture
2.4 CURING MATERIALS
2.4.1 Membrane-Forming Compound
2.4.2 Burlap and Cotton Mat
2.5 WATER
2.6 NONSHRINK GROUT

2.7 LATEX BONDING AGENT
2.8 EPOXY RESIN
2.9 EMBEDDED ITEMS
2.10 JOINT MATERIALS
2.10.1 Joint Fillers, Sealers, and Waterstops
2.11 Fiber-Reinforced Grout
2.18 Concrete Coloring
2.19 Graffiti Coating

PART 3 EXECUTION

3.1 PREPARATION FOR PLACING
3.1.1 Foundations
3.1.1.1 Concrete on Earth Foundations
3.1.1.2 Excavated Surfaces in Lieu of Forms
3.1.2 Previously Placed Concrete
3.1.2.1 Preparation of Previously Placed Concrete
3.1.3 Embedded Items
3.2 CONCRETE PRODUCTION
3.2.1 Batching, Mixing, and Transporting Concrete
3.2.1.1 General
3.2.1.2 Batching Equipment
3.2.1.3 Scales
3.2.1.4 Batching Tolerances
3.2.1.5 Moisture Control
3.2.1.6 Concrete Mixers
3.2.1.7 Stationary Mixers
3.2.1.8 Truck Mixers
3.3 TRANSPORTING CONCRETE TO PROJECT SITE
3.4 CONVEYING CONCRETE ON SITE
3.4.1 Buckets
3.4.2 Transfer Hoppers
3.4.3 Trucks
3.4.4 Chutes
3.4.5 Belt Conveyors
3.4.6 Concrete Pumps
3.5 PLACING CONCRETE
3.5.1 Depositing Concrete
3.5.2 Consolidation
3.5.3 Cold Weather Requirements
3.5.4 Hot Weather Requirements
3.5.5 Prevention of Plastic Shrinkage Cracking
3.5.6 Placing Concrete in Congested Areas
3.6 JOINTS
3.6.1 Construction Joints
3.6.2 Contraction Joints in Slabs on Grade
3.6.3 Expansion Joints
3.6.4 Waterstops
3.6.5 Dowels and Tie Bars
3.7 FINISHING FORMED SURFACES
3.7.1 Class B Finish
3.7.2 Class D Finish
3.8 REPAIRS
3.8.1 Damp-Pack Mortar Repair
3.8.2 Repair of Major Defects
3.8.2.1 Surface Application of Mortar Repair
3.8.2.2 Repair of Deep and Large Defects
3.9 FINISHING UNFORMED SURFACES
3.9.1 General

3.9.2 Floated Finish
3.9.3 Troweled Finish
3.9.4 Broomed Finish
3.10 EXTERIOR SLAB AND RELATED ITEMS
3.10.1 Pavements (Includes Above-Grade Channel)
3.10.2 Sidewalks
3.10.3 Curbs and Gutters
3.11 CURING AND PROTECTION
3.11.1 General
3.11.2 Moist Curing
3.11.3 Membrane Forming Curing Compounds
3.11.4 Ponding or Immersion
3.11.5 Cold Weather Curing and Protection
3.12 BEDDING MORTAR AND GROUT
3.12.1 Damp-Pack Bedding Mortar
3.12.2 Nonshrink Grout
3.12.2.1 Mixing and Placing of Nonshrink Grout
3.12.3 Mixing and Placing of Fiber-Reinforced Grout
3.12.3.1 General Requirements
3.12.3.2 Cold Weather Placement
3.12.3.3 Hot Weather Placement
3.13 TESTING AND INSPECTION FOR CONTRACTOR QUALITY CONTROL
3.13.1 Grading and Corrective Action
3.13.1.1 Fine Aggregate
3.13.1.2 Coarse Aggregate
3.13.2 Quality of Aggregates
3.13.3 Scales, Batching and Recording
3.13.4 Batch-Plant Control
3.13.5 Concrete Mixture
3.13.6 Inspection Before Placing
3.13.7 Placing
3.13.8 Vibrators
3.13.9 Curing Inspection
3.13.10 Cold-Weather Protection
3.13.11 Mixer Uniformity
3.13.12 Reports
3.18 Concrete Coloring
3.18 Graffiti Coating

-- End of Section Table of Contents --

SECTION 03301

CAST-IN-PLACE STRUCTURAL CONCRETE
11/01

PART 1 GENERAL

1.1 REFERENCES

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

ACI INTERNATIONAL (ACI)

ACI 117/117R	(1990; Errata) Standard Tolerances for Concrete Construction and Materials
ACI 211.1	(1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 214.3R	(1988; R 1997) Simplified Version of the Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 305R	(1999) Hot Weather Concreting
ACI 318/318R	(1999) Building Code Requirements for Structural Concrete and Commentary

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(1991; R 1996) Burlap Cloth Made from Jute or Kenaf

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 1059	(1999) Latex Agents for Bonding Fresh to Hardened Concrete
ASTM C 1064/C 1064M	(1999) Temperature of Freshly Mixed Portland Cement Concrete
ASTM C 1077	(1998) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 1107	(1999) Packaged Dry, Hydraulic-Cement Grout(Nonshrink)
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates

ASTM C 143/C 143M	(2000) Slump of Hydraulic Cement Concrete
ASTM C 150	(1999a) Portland Cement
ASTM C 172	(1999) Sampling Freshly Mixed Concrete
ASTM C 173	(1994ael) Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 192/C 192M	(2000) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231	(1997el) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2000) Air-Entraining Admixtures for Concrete
ASTM C 309	(1998a) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 31/C 31M	(2000e1) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1999ae1) Concrete Aggregates
ASTM C 39/C 39M	(2001) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42/C 42M	(1999) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 494/C 494M	(1999ae1) Chemical Admixtures for Concrete
ASTM C 618	(2000) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 78	(1994) Flexural Strength of Concrete (Using Simple Beam With Third-Point Loading)
ASTM C 881	(1999) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 94/C 94M	(2000e2) Ready-Mixed Concrete
ASTM C 940	(1998a) Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory
ASTM C 989	(1999) Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM D 1751	(1999) Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

ASTM D 1752	(1984; R 1996el) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

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

NATIONAL READY-MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA CPMB 100	(1996) Concrete Plant Standards \n/c\X
NRMCA QC 3	(1984) Quality Control Manual: Section 3, Plant Certifications Checklist: Certification of Ready Mixed Concrete Production Facilities
NRMCA TMMB 100	(1994) Truck Mixer Agitator and Front Discharge Concrete Carrier Standards

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 104	(1980) Method of Calculation of the Fineness Modulus of Aggregate
COE CRD-C 400	(1963) Requirements for Water for Use in Mixing or Curing Concrete
COE CRD-C 521	(1981) Standard Test Method for Frequency and Amplitude of Vibrators for Concrete

STATE OF COLORADO, DIVISION OF HIGHWAYS, STATE DEPARTMENT OF HIGHWAYS (CDOT)

(1999) Standard Specifications for Road and Bridge Construction

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Graffiti Coating; G-DO

Manufacturer's literature shall be provided for the anti-graffiti coating. The data shall indicate the method of application and amount of coatings.

Concrete Coloriing; G-DO,

Manufacturer's literature shall include color charts and concrete curing and

mixing requirements.

SD-03 Product Data

Mixture Proportions; G-DO

The results of trial mixture design studies along with a statement giving the maximum nominal coarse aggregate size and the proportions of ingredients that will be used in the manufacture of each strength or class of concrete, at least 14 days prior to commencing concrete placing operations. Aggregate weights shall be based on the saturated surface dry condition. The statement shall be accompanied by test results from an approved independent commercial testing laboratory, showing that mixture design studies have been made with materials proposed for the project and that the proportions selected will produce concrete of the qualities indicated. No substitutions shall be made in the materials used in the mixture design studies without additional tests to show that the quality of the concrete is satisfactory.

SD-06 Test Reports

Testing and Inspection for Contractor Quality Control; G-AO

Certified copies of laboratory test reports, including mill tests and all other test data, for portland cement, blended cement, pozzolan, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.

SD-07 Certificates

Qualifications; G-AO

Written documentation for Contractor Quality Control personnel.

SD-14 Samples

Upstream Channel Mock-up Panel; G-DO,

Mock-up panel shall include approved earthtone coloring and architecutral finish. The panel shall be of a minimum of 8'x8' square to adequately demonstrate the form pattern, concrete coloring and anti-graffiti coating.

Downstream Channel Drop Structure Mock-up Panel; G-AO

Mock-up panel shall be a minimum of 8'x8' square with anti-graffiti coating applied according to manufacturer's recommendations.

1.3 QUALIFICATIONS

Contractor Quality Control personnel assigned to concrete construction shall be American Concrete Institute (ACI) Certified Workmen in one of the following grades or shall have written evidence of having completed similar qualification programs:

Concrete Field Testing Technician, Grade I

Concrete Laboratory Testing Technician, Grade I or II
Concrete Transportation Inspector

Concrete Transportation Construction Inspector or
Reinforced Concrete Special Inspector, Jointly certified by American Concrete Institute (ACI), Building Official and Code Administrators International (BOCA), International Conference of Building Officials (ICBO), and Southern Building Code Congress International (SBCCI).

The foreman or lead journeyman of the flatwork finishing crew shall have similar qualification for ACI Concrete Flatwork Technician/Finisher or equal, with written documentation.

1.4 FIELD TEST PANELS

Field test panels shall be constructed prior to beginning of work using the materials and procedures proposed for use on the job, to demonstrate the results to be attained. The quality and appearance of each panel shall be subject to the approval of the Contracting Officer, and, if not judged satisfactory, additional panels shall be constructed until approval is attained. Formed or finished surfaces in the completed structure shall match the quality and appearance of the approved field example.

1.5 SPECIAL REQUIREMENTS

A pre-installation meeting with the Contracting Officer will be required at least 20 days prior to the start of construction for the concrete channel, box culverts, and underground conduit. The Contractor shall be responsible for calling the meeting; the Project Superintendent and active installation personnel shall be present.

1.6 GENERAL REQUIREMENTS

1.6.1 Strength Requirements and w/c Ratio

1.6.1.1 Strength Requirements

The specified compressive strength (f'c) of all concrete shall be a minimum 4000 pounds per square inch (psi)

a. Evaluation of Concrete Compressive Strength. Compressive strength specimens (6 by 12 inch cylinders) shall be fabricated by the Contractor and laboratory cured in accordance with ASTM C 31/C 31M and tested in accordance with ASTM C 39/C 39M. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equals or exceeds the specified compressive strength f'c and no individual test result falls below the specified strength f'c by more than 500 psi. A "test" is defined as the average of two companion cylinders, or if only one cylinder is tested, the results of the single cylinder test. Additional analysis or testing, including taking cores and/or load tests may be required at the Contractor's expense when the strength of the concrete in the structure is considered potentially deficient.

b. Investigation of Low-Strength Compressive Test Results. When any strength test of standard-cured test cylinders falls below the specified strength requirement by more than 500 psi or if tests of

field-cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized. When the strength of concrete in place is considered potentially deficient, cores shall be obtained and tested in accordance with ASTM C 42/C 42M. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores will be determined by the Contracting Officer to least impair the strength of the structure. Concrete in the area represented by the core testing will be considered adequate if the average strength of the cores is equal to at least 85 percent of the specified strength requirement and if no single core is less than 75 percent of the specified strength requirement. Non-destructive tests (tests other than test cylinders or cores) shall not be used as a basis for acceptance or rejection. The Contractor shall perform the coring and repair the holes. Cores will be tested by the Government.

c. Load Tests. If the core tests are inconclusive or impractical to obtain or if structural analysis does not confirm the safety of the structure, load tests may be directed by the Contracting Officer in accordance with the requirements of ACI 318/318R. Concrete work evaluated by structural analysis or by results of a load test as being understrength shall be corrected in a manner satisfactory to the Contracting Officer. All investigations, testing, load tests, and correction of deficiencies shall be performed by and at the expense of the Contractor and must be approved by the Contracting Officer, except that if all concrete is found to be in compliance with the drawings and specifications, the cost of investigations, testing, and load tests will be at the expense of the Government.

1.6.1.2 Water-Cement Ratio

Maximum water-cement ratio (w/c) for all normal weight concrete shall be 0.45.

These w/c's may cause higher strengths than that required above for compressive or flexural strength. The maximum w/c required will be the equivalent w/c as determined by conversion from the weight ratio of water to cement plus pozzolan, silica fume, and ground granulated blast furnace slag (GGBF slag) by the weight equivalency method as described in ACI 211.1. In the case where silica fume or GGBF slag is used, the weight of the silica fume and GGBF slag shall be included in the equations of ACI 211.1 for the term P which is used to denote the weight of pozzolan.

1.6.2 Air Entrainment

All normal weight concrete shall be air entrained to contain between 4 and 7 percent total air, except that when the nominal maximum size coarse aggregate is 3/4 inch or smaller it shall be between 4.5 and 7.5 percent. Concrete with specified strength over 5000 psi may have 1.0 percent less air than specified above. Specified air content shall be attained at point of placement into the forms. Air content for normal weight concrete shall be determined in accordance with ASTM C 231.

1.6.3 Slump

Slump of the concrete, as delivered to the point of placement into the

forms, shall be within the following limits. Slump shall be determined in accordance with ASTM C 143/C 143M.

Structural Element	Slump Minimum	Slump Maximum
Channel walls and slabs, culvert walls and slabs, foundation walls, substructure (conduit) walls, footings, and slabs	2 in.	5 in.
Any structural concrete approved for placement by pumping:		
At pump	2 in.	6 in.
At discharge of line	2 in.	5 in.

1.6.4 Concrete Temperature

The temperature of the concrete as delivered shall not exceed 90 degrees F. When the ambient temperature during placing is 40 degrees F or less, or is expected to be at any time within 6 hours after placing, the temperature of the concrete as delivered shall be between 55 and 75 degrees F.

1.6.5 Size of Coarse Aggregate

The largest feasible nominal maximum size aggregate (NMSA) specified in paragraph AGGREGATES shall be used in each placement. However, nominal maximum size of aggregate shall not exceed any of the following: three-fourths of the minimum cover for reinforcing bars, three-fourths of the minimum clear spacing between reinforcing bars, one-fifth of the narrowest dimension between sides of forms, or one-third of the thickness of slabs or toppings.

1.7 MIXTURE PROPORTIONS

Concrete shall be composed of portland cement, other cementitious and pozzolanic materials as specified, aggregates, water and admixtures as specified.

1.7.1 Proportioning Studies for Normal Weight Concrete

Trial design batches, mixture proportioning studies, and testing requirements for various classes and types of concrete specified shall be the responsibility of the Contractor. Except as specified for flexural strength concrete, mixture proportions shall be based on compressive strength as determined by test specimens fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 39/C 39M. Samples of all materials used in mixture proportioning studies shall be representative of those proposed for use in the project and shall be accompanied by the manufacturer's or producer's test reports indicating compliance with these specifications. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required on the project. The maximum water-cement ratios required in subparagraph Water-Cement Ratio will be the equivalent water-cement ratio as determined by conversion from the weight ratio of water to cement plus pozzolan, silica fume, and ground

granulated blast furnace slag (GGBF slag) by the weight equivalency method as described in ACI 211.1. In the case where silica fume or GGBF slag is used, the weight of the silica fume and GGBF slag shall be included in the equations in ACI 211.1 for the term P, which is used to denote the weight of pozzolan. If pozzolan is used in the concrete mixture, the minimum pozzolan content shall be 15 percent by weight of the total cementitious material, and the maximum shall be 35 percent. Laboratory trial mixtures shall be designed for maximum permitted slump and air content. Separate sets of trial mixture studies shall be made for each combination of cementitious materials and each combination of admixtures proposed for use. No combination of either shall be used until proven by such studies, except that, if approved in writing and otherwise permitted by these specifications, an accelerator or a retarder may be used without separate trial mixture study. Separate trial mixture studies shall also be made for concrete for any conveying or placing method proposed which requires special properties and for concrete to be placed in unusually difficult placing locations. 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 withASTM C 192/C 192M. They shall be tested at 7 and 28 days in accordance with ASTM C 39/C 39M. From these test results, a curve shall be plotted showing the relationship between water-cement ratio and strength for each set of trial mix studies. In addition, a curve shall be plotted showing the relationship between 7 day and 28 day strengths. Each mixture shall be designed to promote easy and suitable concrete placement, consolidation and finishing, and to prevent segregation and excessive bleeding.

1.7.2 Proportioning Studies for Flexural Strength Concrete

Trial design batches, mixture proportioning studies, and testing requirements shall conform to the requirements specified in paragraph Proportioning Studies for Normal Weight Concrete, except that proportions shall be based on flexural strength as determined by test specimens (beams) fabricated in accordance with ASTM C 192/C 192M and tested in accordance with ASTM C 78. Procedures given in ACI 211.1 shall be modified as necessary to accommodate flexural strength.

1.7.3 Average Compressive Strength Required for Mixtures

The mixture proportions selected during mixture design studies shall produce a required average compressive strength (f'cr) exceeding the specified compressive strength (f'c) by the amount indicated below. This required average compressive strength, f'cr, will not be a required acceptance criteria during concrete production. However, whenever the daily average compressive strength at 28 days drops below f'cr during concrete production, or daily average 7-day strength drops below a strength correlated with the 28-day f'cr, the mixture shall be adjusted, as approved, to bring the daily average back up to f'cr. During production, the required f'cr shall be adjusted, as appropriate, based on the standard deviation being attained on the job.

1.7.3.1 Computations from Test Records

Where a concrete production facility has test records, a standard deviation shall be established in accordance with the applicable provisions of ACI 214.3R. Test records from which a standard deviation is calculated shall represent materials, quality control procedures, and conditions similar to those expected; shall represent concrete produced to meet a specified strength or strengths (f'c) within 1,000 psi of that specified for proposed

work; and shall consist of at least 30 consecutive tests. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. Required average compressive strength f'cr used as the basis for selection of concrete proportions shall be the larger of the equations that follow using the standard deviation as determined above:

f'cr = f'c + 1.34S where units are in psi

f'cr = f'c + 2.33S - 500 where units are in psi

Where S = standard deviation

Where a concrete production facility does not have test records meeting the requirements above but does have a record based on 15 to 29 consecutive tests, a standard deviation shall be established as the product of the calculated standard deviation and a modification factor from the following table:

NUMBER OF TESTS	MODIFICATION FACTOR FOR STANDARD DEVIATION
15	1.16
20	1.08
25	1.03
30 or more	1.00

1.7.3.2 Computations without Previous Test Records

When a concrete production facility does not have sufficient field strength test records for calculation of the standard deviation, the required average strength f'cr shall be determined as follows:

b. If the specified compressive strength f'c is 3,000 to 5,000 psi,

f'cr = f'c + 1,200 psi

1.8 STORAGE OF MATERIALS

Cement and other cementitious materials shall be stored in weathertight buildings, bins, or silos which will exclude moisture and contaminants and keep each material completely separated. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of aggregates. Aggregate shall not be stored directly on the ground unless a sacrificial layer is left undisturbed. Reinforcing bars and accessories shall be stored above the ground on platforms, skids or other supports. Other materials shall be stored in such a manner as to avoid contamination and deterioration. Admixtures which have been in storage at the project site for longer than 6 months or which have been subjected to freezing shall not be used unless retested and proven to meet the specified requirements. Materials shall be capable of being accurately identified after bundles or containers are opened.

1.9 GOVERNMENT ASSURANCE INSPECTION AND TESTING

Day-to day inspection and testing shall be the responsibility of the Contractor Quality Control (CQC) staff. However, representatives of the Contracting Officer can and will inspect construction as considered

appropriate and will monitor operations of the Contractor's CQC staff. Government inspection or testing will not relieve the Contractor of any of his CQC responsibilities.

1.9.1 Fresh Concrete

Fresh concrete will be sampled as delivered in accordance with ASTM C 172 and tested in accordance with these specifications, as considered necessary.

1.9.2 Hardened Concrete

Tests on hardened concrete will be performed by the Government when such tests are considered necessary.

1.9.3 Inspection

Concrete operations may be tested and inspected by the Government as the project progresses. Failure to detect defective work or material will not prevent rejection later when a defect is discovered nor will it obligate the Government for final acceptance.

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS

Cementitious Materials shall be portland cement, or portland cement in combination with pozzolan or ground granulated blast furnace slag and shall conform to appropriate specifications listed below. Use of cementitious materials in concrete which will have surfaces exposed in the completed structure shall be restricted so there is no change in color, source, or type of cementitious material.

2.1.1 Portland Cement

ASTM C 150, Type V. White Type III shall be used only in specific areas of the structure, when approved in writing prior to use by the Contracting Officer.

2.1.2 High-Early-Strength Portland Cement

ASTM C 150, Type III with tricalcium aluminate limited to 5 percent, low alkali. Type III cement shall be used only in isolated instances and only when approved in writing prior to use by the Contracting Officer.

2.1.3 Pozzolan (Fly Ash)

ASTM C 618, Class F with the optional requirements for multiple factor, drying shrinkage, and uniformity from Table 2A of ASTM C 618. Requirement for maximum alkalies from Table 1A of ASTM C 618 shall apply. If pozzolan is used, it shall never be less than 15 percent nor more than 35 percent by weight of the total cementitious material. The Contractor shall comply with EPA requirements in accordance with Section 01355A ENVIRONMENTAL PROTECTION.

2.1.4 Ground Granulated Blast-Furnace (GGBF) Slag

ASTM C 989, Grade 120.

2.2 AGGREGATES

Aggregates shall conform to the following.

2.2.1 Fine Aggregate

Fine aggregate shall conform to the quality and gradation requirements of ASTM C 33.

2.2.2 Coarse Aggregate

Coarse aggregate shall conform to ASTM C 33, Class 5S, size designation 57 or 67.

2.3 CHEMICAL ADMIXTURES

Chemical admixtures, when required or permitted, shall conform to the appropriate specification listed. Admixtures shall be furnished in liquid form and of suitable concentration for easy, accurate control of dispensing.

2.3.1 Air-Entraining Admixture

ASTM C 260 and shall consistently entrain the air content in the specified ranges under field conditions.

2.3.2 Accelerating Admixture

ASTM C 494/C 494M, Type C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

2.3.3 Water-Reducing or Retarding Admixture

ASTM C 494/C 494M, Type A, B, or D, except that the 6-month and 1-year compressive and flexural strength tests are waived.

2.4 CURING MATERIALS

2.4.1 Membrane-Forming Compound

Membrane-Forming curing compound shall conform to ASTM C 309, Type 1-D, Class A or B for concrete except the open flow channel and that only a styrene acrylate or chlorinated rubber compound meeting Class B requirements shall be used for surfaces that are to be painted or are to receive bituminous roofing, or waterproofing, or floors that are to receive adhesive applications of resilient flooring. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing, or flooring specified. Nonpigmented compound shall contain a fugitive dye. The open channel shall use Type 2, Class A or B.

2.4.2 Burlap and Cotton Mat

Burlap and cotton mat used for curing shall conform to AASHTO M 182.

2.5 WATER

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

2.6 NONSHRINK GROUT

Nonshrink grout shall conform to ASTM C 1107, Grade A, B or C, and shall be a commercial formulation suitable for the proposed application.

2.7 LATEX BONDING AGENT

Latex agents for bonding fresh to hardened concrete shall conform to ASTM C 1059.

2.8 EPOXY RESIN

Epoxy resins for use in repairs shall conform to ASTM C 881, Type V, Grade 2. Class as appropriate to the existing ambient and surface temperatures.

2.9 EMBEDDED ITEMS

Embedded items shall be of the size and type indicated or as needed for the application. Dovetail slots shall be galvanized steel.

2.10 JOINT MATERIALS

2.10.1 Joint Fillers, Sealers, and Waterstops

Expansion joint fillers shall be preformed materials conforming to ASTM D 1751 or ASTM D 1752]. Materials for waterstops shall be in accordance with Section 03250 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS. Materials for and sealing of joints shall conform to the requirements of Section 03250 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS USED IN CONCRETE.

2.11 Fiber-Reinforced Grout

Grout shall consist of Portland cement, sand, and gravel, thoroughly mixed with water to produce grout having a thick, creamy consistency. The minimum amount of water shall be used to prevent excessive shrinkage of the grout after placement. Cement, sand, and water shall conform to Subsections 701.01, 703.01 and 712.01 of the Colorado Department of Transportation (CDOT) Standard Specifications, respectively. Aggregate for grout shall consist of 70 percent sand and 30 percent 3/8-inch diameter rock. All concrete grout shall be produced from Type II Portland cement with less than 5 percent tricalcium aluminate. Type C or F fly ash, meeting requirements of ASTM C 618, may be substituted for up to 25 percent of the Portland cement. Grout shall have a minimum cement content of 6 sacks per cubic yard and a maximum water content of 7 gallons per sack. To control shrinkage and cracking, 1.5 pounds of 3/4-inch long Fibermesh or equivalent fibers shall be added per cubic yard of concrete. Grout strength shall be 2,000 psi in 28 days. Air entrainment shall be 6 to 9 percent, and slump shall be 4 to 8 inches. Air-entraining agents shall conform to ASTM C 260 and water reducing agents shall conform to ASTM C 494.

2.18 Concrete Coloring

Concrete coloring shall be provided for the upstream channel walls. The concrete coloring shall be an earthtone color and shall be "Uni-Mix Integral Concrete Colorant" produced by Butterfield Color or approved equal.

2.19 Graffiti Coating

Graffiti coating shall be applied to exposed vertical walls on the upstream

and downstream channels. Graffiti coating shall be "Acryli-Master Anti-Graffiti Coating" produced by Graffiti Master Products or approved equal. Contractor shall verify compatibility of all concrete finshing products.

PART 3 EXECUTION

3.1 PREPARATION FOR PLACING

Before commencing concrete placement, the following shall be performed. Surfaces to receive concrete shall be clean and free from frost, ice, mud, and water. Forms shall be in place, cleaned, coated, and adequately supported, in accordance with Section 03100 STRUCTURAL CONCRETE FORMWORK. Reinforcing steel shall be in place, cleaned, tied, and adequately supported, in accordance with Section 03200 CONCRETE REINFORCEMENT. Transporting and conveying equipment shall be in-place, ready for use, clean, and free of hardened concrete and foreign material. Equipment for consolidating concrete shall be at the placing site and in proper working order. Equipment and material for curing and for protecting concrete from weather or mechanical damage shall be at the placing site, in proper working condition and in sufficient amount for the entire placement. When hot, windy conditions during concreting appear probable, equipment and material shall be at the placing site to provide windbreaks, shading, fogging, or other action to prevent plastic shrinkage cracking or other damaging drying of the concrete.

3.1.1 Foundations

3.1.1.1 Concrete on Earth Foundations

Earth (subgrade, base, or subbase courses) surfaces upon which concrete is to be placed shall be clean, damp, and free from debris, frost, ice, and standing or running water. Prior to placement of concrete, the foundation shall be well drained and shall be satisfactorily graded and uniformly compacted.

3.1.1.2 Excavated Surfaces in Lieu of Forms

Concrete for footings may be placed directly against the soil provided the earth or rock has been carefully trimmed, is uniform and stable, and meets the compaction requirements of Section 02210 GRADING. The concrete shall be placed without becoming contaminated by loose material, and the outline of the concrete shall be within the specified tolerances.

3.1.2 Previously Placed Concrete

3.1.2.1 Preparation of Previously Placed Concrete

Concrete surfaces to which other concrete is to be bonded shall be abraded in an approved manner that will expose sound aggregate uniformly without damaging the concrete. Laitance and loose particles shall be removed. Surfaces shall be thoroughly washed and shall be moist but without free water when concrete is placed.

3.1.3 Embedded Items

Before placement of 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. Conduit and other embedded items shall be clean

and 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 voids. Welding shall not be performed on embedded metals within 1 feet of the surface of the concrete. Tack welding shall not be performed on or to embedded items.

3.2 CONCRETE PRODUCTION

3.2.1 Batching, Mixing, and Transporting Concrete

Ready-mixed concrete shall be batched, mixed, and transported in accordance with ASTM C 94/C 94M, except as otherwise specified. Truck mixers, agitators, and nonagitating transporting units shall comply with NRMCA TMMB 100. Ready-mix plant equipment and facilities shall be certified in accordance with NRMCA QC 3. Approved batch tickets shall be furnished for each load of ready-mixed concrete.

3.2.1.1 General

The batching plant shall be located off site and close to the project. The batching, mixing and placing system shall have a capacity of at least 125 cubic yards per hour. The batching plant shall conform to the requirements of NRMCA CPMB 100 and as specified; however, rating plates attached to batch plant equipment are not required.

3.2.1.2 Batching Equipment

The batching controls shall be semiautomatic or automatic, as defined in NRMCA CPMB 100. A semiautomatic batching system shall be provided with interlocks such that the discharge device cannot be actuated until the indicated material is within the applicable tolerance. The batching system shall be equipped with accurate recorder or recorders that meet the requirements of NRMCA CPMB 100. The weight of water and admixtures shall be recorded if batched by weight. Separate bins or compartments shall be provided for each size group of aggregate and type of cementitious material, to prevent intermingling at any time. Aggregates shall be weighed either in separate weigh batchers with individual scales or, provided the smallest size is batched first, cumulatively in one weigh batcher on one scale. Aggregate shall not be weighed in the same batcher with cementitious material. If both portland cement and other cementitious material are used, they may be batched cumulatively, provided that the portland cement is batched first, except that silica fume shall always be batched separately. Water may be measured by weight or volume. Water shall not be weighed or measured cumulatively with another ingredient. Filling and discharging valves for the water metering or batching system shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed. Piping for water and for admixtures shall be free from leaks and shall be properly valved to prevent backflow or siphoning. Admixtures shall be furnished as a liquid of suitable concentration for easy control of dispensing. An adjustable, accurate, mechanical device for measuring and dispensing each admixture shall be provided. Each admixture dispenser shall be interlocked with the batching and discharging operation of the water so that each admixture is separately batched and individually discharged automatically in a manner to obtain uniform distribution throughout the water as it is added to the batch in the specified mixing period. When use of truck mixers makes this requirement impractical, the admixture dispensers shall be interlocked with

the sand batchers. Different admixtures shall not be combined prior to introduction in water and shall not be allowed to intermingle until in contact with the cement. Admixture dispensers shall have suitable devices to detect and indicate flow during dispensing or have a means for visual observation. 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 of aggregates from each bin or compartment, and for sampling and calibrating the dispensing of cementitious material, water, and admixtures. Filling ports for cementitious materials bins or silos shall be clearly marked with a permanent sign stating the contents.

3.2.1.3 Scales

The weighing equipment shall conform to the applicable requirements of CPMB Concrete Plant Standard, and of NIST HB 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 specified frequency in the presence of a Government inspector. The weighing equipment shall be arranged so that the plant operator can conveniently observe all dials or indicators.

3.2.1.4 Batching Tolerances

(A) Tolerances with Weighing Equipment

MATERIAL	PERCENT OF REQUIRED WEIGHT
Cementitious materials	0 to plus 2
Aggregate	plus or minus 2
Water	plus or minus 1
Chemical admixture	0 to plus 6

(B) Tolerances with Volumetric Equipment

For volumetric batching equipment used for water and admixtures, the following tolerances shall apply to the required volume of material being batched:

MATERIAL	PERCENT OF REQUIRED MATERIAL
Water:	plus or minus 1 percent
Chemical admixtures:	0 to plus 6 percent

3.2.1.5 Moisture Control

The plant shall be capable of ready adjustment to compensate for the varying moisture content of the aggregates and to change the weights of the materials being batched.

3.2.1.6 Concrete Mixers

Mixers shall be stationary mixers or truck mixers. Mixers shall be capable of combining the materials into a uniform mixture and of discharging this mixture without segregation. 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 by the manufacturer. 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.

3.2.1.7 Stationary Mixers

Concrete plant mixers shall be drum-type mixers of tilting, nontilting, horizontal-shaft, or vertical-shaft type, or shall be pug mill 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 all the requirements in ASTM C 94/C 94M applicable to central-mixed concrete.

3.2.1.8 Truck Mixers

Truck mixers, the mixing of concrete therein, and concrete uniformity shall conform to the requirements of ASTM C 94/C 94M. 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 is possible to determine the number of revolutions at mixing speed and the number of revolutions at agitating speed. Or, if approved by the Contracting Officer in lieu of this, the number of revolutions shall be marked on the batch tickets. Water shall not be added at the placing site unless specifically approved; and in no case shall it exceed the specified w/c. Any such water shall be injected at the base of the mixer, not at the discharge end.

3.3 TRANSPORTING CONCRETE TO PROJECT SITE

Concrete shall be transported to the placing site in truck mixers, conforming to NRMCA TMMB 100 or by approved pumping equipment or conveyors.

3.4 CONVEYING CONCRETE ON SITE

Concrete shall be conveyed from mixer or transporting unit to forms as rapidly as possible and within the time interval specified by methods which will prevent segregation or loss of ingredients using the following equipment. Conveying equipment shall be cleaned before each placement.

3.4.1 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 not be less than 2 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 that buckets larger than 2 cubic yardsshall 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.

3.4.2 Transfer Hoppers

Concrete may be charged into nonagitating hoppers for transfer to other conveying devices. Transfer hoppers shall be capable of receiving concrete

directly from delivery vehicles and shall have conical-shaped discharge features. The transfer hopper shall be equipped with a hydraulically operated gate and with a means of external vibration to effect complete discharge. Concrete shall not be held in nonagitating transfer hoppers more than 30 minutes.

3.4.3 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/C 94M. Nonagitating equipment shall be used only for transporting plant-mixed concrete over a smooth road and when the hauling time is less than 15 minutes. Bodies of nonagitating equipment shall be smooth, watertight, metal containers specifically designed to transport concrete, shaped with rounded corners to minimize segregation, and equipped with gates that will permit positive discharge control of the concrete.

3.4.4 Chutes

When concrete can be placed directly from a truck mixer, agitator, or nonagitating equipment, the chutes normally attached to this equipment by the manufacturer 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.

3.4.5 Belt Conveyors

Belt conveyors shall be designed and operated to assure a 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, such as discharge baffle or hopper , for preventing segregation of the concrete at the transfer points and the point of placing. Belt conveyors shall be constructed such that the idler spacing shall not exceed 36 inches. The belt speed shall be a minimum of 300 feet per minute and a maximum of 750 feet per minute. If concrete is to be placed through installed horizontal or sloping reinforcing bars, the conveyor shall discharge concrete into a pipe or elephant truck that is long enough to extend through the reinforcing bars.

3.4.6 Concrete Pumps

Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure type; pneumatic placing equipment shall not be used. The pipeline shall be rigid steel pipe or heavy-duty flexible hose. The inside diameter of the pipe shall be at least 3 times the nominal maximum-size coarse aggregate in the concrete mixture to be pumped but not less than 4 inches. Aluminum pipe shall not be used.

3.5 PLACING CONCRETE

Mixed concrete shall be discharged within 1-1/2 hours or before the mixer drum has revolved 300 revolutions, whichever comes first after the introduction of the mixing water to the cement and aggregates. When the concrete temperature exceeds 85 degrees F, the time shall be reduced to 45 minutes. Concrete shall be placed within 15 minutes after it has been discharged from the transporting unit. Concrete shall be handled from mixer or transporting unit to forms in a continuous manner until the approved unit of operation is completed. Adequate scaffolding, ramps and

walkways shall be provided so that personnel and equipment are not supported by in-place reinforcement. Placing will not be permitted when the sun, heat, wind, or limitations of facilities furnished by the Contractor prevent proper consolidation, finishing and curing. Sufficient placing capacity shall be provided so that concrete can be kept free of cold joints.

3.5.1 Depositing Concrete

Concrete shall be deposited as close as possible to its final position in the forms, and 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 will be effectively consolidated in horizontal layers not more than 12 inches thick, except that all slabs shall be placed in a single layer. Concrete to receive other construction shall be screeded to the proper level. Concrete shall be deposited continuously in one layer or in layers so that fresh concrete is deposited on in-place concrete that is still plastic. Fresh concrete shall not be deposited on concrete that has hardened sufficiently to cause formation of seams or planes of weakness within the section. Concrete that has surface dried, partially hardened, or contains foreign material shall not be used. When temporary spreaders are used in the forms, the spreaders shall be removed as their service becomes unnecessary.

3.5.2 Consolidation

Immediately after placing, each layer of concrete shall be consolidated by internal vibrators, except for slabs 4 inches thick or less. The vibrators shall at all times be adequate in effectiveness and number to properly consolidate the concrete; a spare vibrator shall be kept at the jobsite during all concrete placing operations. The vibrators shall have a frequency of not less than 10,000 vibrations per minute, an amplitude of at least 0.025 inch, and the head diameter shall be appropriate for the structural member and the concrete mixture being placed. Vibrators shall be inserted vertically at uniform spacing over the area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator so that the area being vibrated will overlap the adjacent just-vibrated area by a reasonable amount. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if there is such. Vibrator shall be held stationary until the concrete is consolidated and then vertically withdrawn slowly while operating. Form vibrators shall not be used unless specifically approved and unless forms are constructed to withstand their use. Vibrators shall not be used to move concrete within the forms. Slabs 4 inches and less in thickness shall be consolidated by properly designed vibrating screeds or other approved technique. Frequency and amplitude of vibrators shall be determined in accordance with COE CRD-C 521. Grate tampers ("jitterbugs") shall not be used.

3.5.3 Cold Weather Requirements

Special protection measures, approved by the Contracting Officer, shall be used if freezing temperatures are anticipated before the expiration of the specified curing period. The ambient temperature of the air where concrete is to be placed and the temperature of surfaces to receive concrete shall be not less than 40 degrees F. The temperature of the concrete when placed shall be not less than 50 degrees F nor more than 75 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete

placing temperature. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals or other materials shall not be incorporated in the concrete to prevent freezing. Upon written approval, an accelerating admixture conforming to ASTM C 494/C 494M, Type C or E may be used, provided it contains no calcium chloride. Calcium chloride shall not be used.

3.5.4 Hot Weather Requirements

When the ambient temperature during concrete placing is expected to exceed 85 degrees F, the concrete shall be placed and finished with procedures previously submitted and as specified herein. The concrete temperature at time of delivery to the forms shall not exceed the temperature shown in the table below when measured in accordance with ASTM C 1064/C 1064M. Cooling of the mixing water or aggregates or placing concrete in the cooler part of the day may be required to obtain an adequate placing temperature. A retarder may be used, as approved, to facilitate placing and finishing. Steel forms and reinforcements shall be cooled as approved prior to concrete placement when steel temperatures are greater than 120 degrees F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

Maximum Allowable Concrete Placing Temperature

Relative Humidity, Percent, During Time of Concrete Placement	Maximum Allowable Concrete Temperature Degrees
Greater than 60	90 F
40-60	85 F
Less than 40	80 F

3.5.5 Prevention of Plastic Shrinkage Cracking

During hot weather with low humidity, and particularly with appreciable wind, as well as interior placements when space heaters produce low humidity, the Contractor shall be alert to the tendency for plastic shrinkage cracks to develop and shall institute measures to prevent this. Particular care shall be taken if plastic shrinkage cracking is potentially imminent and especially if it has developed during a previous placement. Periods of high potential for plastic shrinkage cracking can be anticipated by use of Fig. 2.1.5 of ACI 305R. In addition the concrete placement shall be further protected by erecting shades and windbreaks and by applying fog sprays of water, sprinkling, ponding or wet covering. Plastic shrinkage cracks that occur shall be filled by injection of epoxy resin as directed, after the concrete hardens. Plastic shrinkage cracks shall never be troweled over or filled with slurry.

3.5.6 Placing Concrete in Congested Areas

Special care shall be used to ensure complete filling of the forms, elimination of all voids, and complete consolidation of the concrete when placing concrete in areas congested with reinforcing bars, embedded items, waterstops and other tight spacing. An appropriate concrete mixture shall be used, and the nominal maximum size of aggregate (NMSA) shall meet the specified criteria when evaluated for the congested area. Vibrators with heads of a size appropriate for the clearances available shall be used, and

the consolidation operation shall be closely supervised to ensure complete and thorough consolidation at all points. Where necessary, splices of reinforcing bars shall be alternated to reduce congestion. Where two mats of closely spaced reinforcing are required, the bars in each mat shall be placed in matching alignment to reduce congestion. Reinforcing bars may be temporarily crowded to one side during concrete placement provided they are returned to exact required location before concrete placement and consolidation are completed.

3.6 JOINTS

Joints shall be located and constructed as indicated or approved. Joints not indicated on the drawings shall be located and constructed to minimize the impact on the strength of the structure. In general, such joints shall be located near the middle of the spans of supported slabs, beams, and girders unless a beam intersects a girder at this point, in which case the joint in the girder shall be offset a distance equal to twice the width of the beam. Joints in walls and columns shall be at the underside of floors, slabs, beams, or girders and at the tops of footings or floor slabs, unless otherwise approved. Joints shall be perpendicular to the main reinforcement. All reinforcement shall be continued across joints; except that reinforcement or other fixed metal items shall not be continuous through expansion joints, or through construction or contraction joints in slabs on grade. Reinforcement shall be 2 inches clear from each joint. Except where otherwise indicated, construction joints between interior slabs on grade and vertical surfaces shall consist of 30 pound asphalt-saturated felt, extending for the full depth of the slab. The perimeters of the slabs shall be free of fins, rough edges, spalling, or other unsightly appearance. Reservoir for sealant for construction and contraction joints in slabs shall be formed to the dimensions shown on the drawings by removing snap-out joint-forming inserts, by sawing sawable inserts, or by sawing to widen the top portion of sawed joints. Joints to be sealed shall be cleaned and sealed as indicated and in accordance with Section 03250 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS USED IN CONCRETE.

3.6.1 Construction Joints

For concrete other than slabs on grade, construction joints shall be located so that the unit of operation does not exceed _30____] feet. Concrete shall be placed continuously so that each unit is monolithic in construction. Fresh concrete shall not be placed against adjacent hardened concrete until it is at least 24 hours old. Construction joints shall be located as indicated or approved. Where concrete work is interrupted by weather, end of work shift or other similar type of delay, location and type of construction joint shall be subject to approval of the Contracting Officer. Unless otherwise indicated and except for slabs on grade, reinforcing steel shall extend through construction joints. Construction joints in slabs on grade shall be keyed or doweled as shown. Other lifts shall terminate at such levels as to conform to structural requirements Prior to placing additional concrete, horizontal construction joints shall be prepared as specified in paragraph Previously Placed Concrete.

3.6.2 Contraction Joints in Slabs on Grade

Contraction joints shall be located and detailed as shown on the drawings. Contraction Joints shall be produced by forming a weakened plane in the concrete slab by sawing a continuous slot with a concrete saw. Regardless of method used to produce the weakened plane, it shall be 1/4 the depth of

the slab thickness and between 1/8 and 3/16 inch wide. For saw-cut joints, cutting shall be timed properly with the set of the concrete. Cutting shall be started as soon as the concrete has hardened sufficiently to prevent ravelling of the edges of the saw cut. Cutting shall be completed before shrinkage stresses become sufficient to produce cracking. Reservoir for joint sealant shall be formed as previously specified.

3.6.3 Expansion Joints

Installation of expansion joints and sealing of these joints shall conform to the requirements of Section 03250 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS USED IN CONCRETE.

3.6.4 Waterstops

Waterstops shall be installed in conformance with the locations and details shown on the drawings using materials and procedures specified in Section 03250 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS USED IN CONCRETE.

3.6.5 Dowels and Tie Bars

Dowels and tie bars shall be installed at the locations shown on the drawings and to the details shown, using materials and procedures specified in Section 03200 CONCRETE REINFORCEMENT and herein. Conventional smooth "paving" dowels shall be installed in slabs using approved methods to hold the dowel in place during concreting within a maximum alignment tolerance of 1/8 inch in 12 inches. "Structural" type deformed bar dowels, or tie bars, shall be installed to meet the specified tolerances. Care shall be taken during placing adjacent to and around dowels and tie bars to ensure there is no displacement of the dowel or tie bar and that the concrete completely embeds the dowel or tie bar and is thoroughly consolidated.

3.7 FINISHING FORMED SURFACES

Forms, form materials, and form construction are specified in Section 03100 STRUCTURAL CONCRETE FORMWORK. Finishing of formed surfaces shall be as specified herein. Unless another type of architectural or special finish is specified, surfaces shall be left with the texture imparted by the forms except that defective surfaces shall be repaired. Unless painting of surfaces is required, uniform color of the concrete shall be maintained by use of only one mixture without changes in materials or proportions for any structure or portion of structure that requires a Class B finish. Except for major defects, as defined hereinafter, surface defects shall be repaired as specified herein within 24 hours after forms are removed. Repairs of the so-called "plaster-type" will not be permitted in any location. Tolerances of formed surfaces shall conform to the requirements of ACI 117/117R. These tolerances apply to the finished concrete surface, not to the forms themselves; forms shall be set true to line and grade. Form tie holes requiring repair and other defects whose depth is at least as great as their surface diameter shall be repaired as specified in paragraph Damp-Pack Mortar Repair. Defects whose surface diameter is greater than their depth shall be repaired as specified in paragraph Repair of Major Defects. Repairs shall be finished flush with adjacent surfaces and with the same surface texture. The cement used for all repairs shall be a blend of job cement with white cement proportioned so that the final color after curing and aging will be the same as the adjacent concrete. Concrete with excessive honeycomb, or other defects which affect the strength of the member, will be rejected. Repairs shall be demonstrated to be acceptable and free from cracks or loose or drummy areas at the

completion of the contract and, for Class A and B Finishes, shall be inconspicuous. Repairs not meeting these requirements will be rejected and shall be replaced.

3.7.1 Class B Finish

Class B finish is required on all surfaces not designated to receive a Class D finish. Fins, ravelings, and loose material shall be removed, all surface defects over 1/2 inch in diameter or more than 1/2 inch deep, shall be repaired and, except as otherwise indicated or as specified in Section 03100 STRUCTURAL CONCRETE FORMWORK, holes left by removal of form ties shall be reamed and filled. Defects more than 1/2 inchin diameter shall be cut back to sound concrete, but in all cases at least 1 inch deep. The Contractor shall prepare a sample panel for approval (as specified in PART 1) before commencing repair, showing that the surface texture and color match will be attained. Metal tools shall not be used to finish repairs in Class A surfaces.

3.7.2 Class D Finish

Class D finish is required on all concrete surfaces against which backfill will be placed or surfaces not permanently exposed to view. Fins, ravelings, and loose material shall be removed, and, except as otherwise indicated or as specified in Section 03100 STRUCTURAL CONCRETE FORMWORK, holes left by removal of form ties shall be reamed and filled. Honeycomb and other defects more than 1/2 inch deep or more than 2 inches in diameter shall be repaired. Defects more than 2 inches in diameter shall be cut back to sound concrete, but in all cases at least 1 inch deep.

3.8 REPAIRS

3.8.1 Damp-Pack Mortar Repair

Form tie holes requiring repair and other defects whose depth is at least as great as their surface diameter but not over 4 inchesshall be repaired by the damp-pack mortar method. Form tie holes shall be reamed and other similar defects shall be cut out to sound concrete. The void shall then be thoroughly cleaned, thoroughly wetted, brush-coated with a thin coat of neat cement grout and filled with mortar. Mortar shall be a stiff mix of 1 part portland cement to 2 parts fine aggregate passing the No. 16 mesh sieve, and minimum amount of water. Only sufficient water shall be used to produce a mortar which, when used, will stick together on being molded into a ball by a slight pressure of the hands and will not exude water but will leave the hands damp. Mortar shall be mixed and allowed to stand for 30 to 45 minutes before use with remixing performed immediately prior to use. Mortar shall be thoroughly tamped in place in thin layers using a hammer and hardwood block. Holes passing entirely through walls shall be completely filled from the inside face by forcing mortar through to the outside face. All holes shall be packed full. Damp-pack repairs shall be moist cured for at least 48 hours.

3.8.2 Repair of Major Defects

Major defects will be considered to be those more than 1/2 inch deep or, for Class B finish, more than 1/2 inch in diameter and, for Class D finish, more than 2 inches in diameter. Also included are any defects of any kind whose depth is over 4 inches or whose surface diameter is greater than their depth. Major defects shall be repaired as specified below.

3.8.2.1 Surface Application of Mortar Repair

Defective concrete shall be removed, and removal shall extend into completely sound concrete. Approved equipment and procedures which will not cause cracking or microcracking of the sound concrete shall be used. If reinforcement is encountered, concrete shall be removed so as to expose the reinforcement for at least 2 inches on all sides. All such defective areas greater than 12 square inchesshall be outlined by saw cuts at least 1 inch deep. Defective areas less than 12 square inches shall be outlined by a 1 inch deep cut with a core drill in lieu of sawing. All saw cuts shall be straight lines in a rectangular pattern in line with the formwork panels. After concrete removal, the surface shall be thoroughly cleaned by high pressure washing to remove all loose material. Surfaces shall be kept continually saturated for the first 12 of the 24 hours immediately before placing mortar and shall be damp but not wet at the time of commencing mortar placement. The Contractor, at his option, may use either hand-placed mortar or mortar placed with a mortar gun. If hand-placed mortar is used, the edges of the cut shall be perpendicular to the surface of the concrete. The prepared area shall be brush-coated with a thin coat of neat cement grout. The repair shall then be made using a stiff mortar, preshrunk by allowing the mixed mortar to stand for 30 to 45 minutes and then remixed, thoroughly tamped into place in thin layers. If hand-placed mortar is used, the Contractor shall test each repair area for drumminess by firm tapping with a hammer and shall inspect for cracks, both in the presence of the Contracting Officer's representative, immediately before completion of the contract, and shall replace any showing drumminess or cracking. If mortar placed with a mortar gun is used, the gun shall be a small compressed air-operated gun to which the mortar is slowly hand fed and which applies the mortar to the surface as a high-pressure stream, as approved. Repairs made using shotcrete equipment will not be accepted. The mortar used shall be the same mortar as specified for damp-pack mortar repair. If gun-placed mortar is used, the edges of the cut shall be beveled toward the center at a slope of 1:1. All surface applied mortar repairs shall be continuously moist cured for at least 7 days. Moist curing shall consist of several layers of saturated burlap applied to the surface immediately after placement is complete and covered with polyethylene sheeting, all held closely in place by a sheet of plywood or similar material rigidly braced against it. Burlap shall be kept continually wet.

3.8.2.2 Repair of Deep and Large Defects

Deep and large defects will be those that are more than 6 inches deep and also have an average diameter at the surface more than 18 inches or that are otherwise so identified by the Project Office. Such defects shall be repaired as specified herein or directed, except that defects which affect the strength of the structure shall not be repaired and that portion of the structure shall be completely removed and replaced. Deep and large defects shall be repaired by procedures approved in advance including forming and placing special concrete using applied pressure during hardening. Preparation of the repair area shall be as specified for surface application of mortar. In addition, the top edge (surface) of the repair area shall be sloped at approximately 20 degrees from the horizontal, upward toward the side from which concrete will be placed. The special concrete shall be a concrete mixture with low water content and low slump, and shall be allowed to age 30 to 60 minutes before use. Concrete containing a specified expanding admixture may be used in lieu of the above mixture; the paste portion of such concrete mixture shall be designed to have an expansion between 2.0 and 4.0 percent when tested in accordance

with ASTM C 940. A full width "chimney" shall be provided at the top of the form on the placing side to ensure filling to the top of the opening. A pressure cap shall be used on the concrete in the chimney with simultaneous tightening and revibrating the form during hardening to ensure a tight fit for the repair. The form shall be removed after 24 hours and immediately the chimney shall be carefully chipped away to avoid breaking concrete out of the repair; the surface of the repair concrete shall be dressed as required.

3.9 FINISHING UNFORMED SURFACES

The finish of all unformed surfaces shall meet requirements of paragraph TOLERANCES, in PART 1, when tested as specified herein.

3.9.1 General

The ambient temperature of spaces adjacent to unformed surfaces being finished and of the base on which concrete will be placed shall be not less than 50 degrees F. During period of hot weather, requirements in paragraphs "Hot Weather Requirements", and "Prevention of Plastic Shrinkage Cracking", shall be adhered to. Unformed surfaces that are not to be covered by additional concrete or backfill shall have a float finish, with additional finishing as specified below. Unformed surfaces shall comply with elevation requirements shown on the drawings. Surfaces to receive additional concrete or backfill shall be brought to the elevation shown on the drawings, properly consolidated, and left true and regular. Unless otherwise shown on the drawings, exterior surfaces shall be sloped for drainage, as directed. Where drains are provided, interior floors shall be evenly sloped to the drains. Joints shall be carefully made with a jointing or edging tool. Finished surfaces shall be protected from stains or abrasions. Grate tampers or "jitterbugs" shall not be used for any surfaces. Dusting or surfaces with dry cement or other materials or the addition of any water during finishing shall not be permitted. If bleedwater is present prior to finishing, excess water shall be carefully dragged off or removed by absorption with porous material such as burlap. During finishing oeprations, extreme care shall be taken to prevent over finishing or working water into the surface; this can cause "crazing" (surface shrinkage cracks which appear after hardening) of the surface. Any slabs with surfaces which exhibit significant crazing shall be removed and replaced. During finishing operations, surfaces shall be checked with a 10-foot straightedge, applied in both directions at regular intervals while the concrete is plastic, to detect high or low areas.

3.9.2 Floated Finish

Slabs to receive more than a rough slab finish shall be given a wood float finish. Screeding shall be immediately followed by darbying or bull floating before bleed water is present, to bring the surface to a true, even plane. After concrete has stiffened to withstand a man's weight without an imprint of more than 1/4 inch and the water sheen has disappeared, it shall be floated to a true and even plane free of ridges. Floating shall be performed by use of suitable hand floats or power driven equipment. Sufficient pressure shall be used on the floats to bring a film of moisture to the surface. Hand floats shall be made of wood, magnesium, or aluminum. Lightweight concrete or concrete that exhibits stickiness shall be floated with a magnesium float. Care shall be taken to prevent over-finishing or incorporating water into the surface.

3.9.3 Troweled Finish

Top of all walls shall be given a trowel finish. After floating is complete and after the surface moisture has disappeared, unformed surfaces shall be steel-troweled to a smooth, even, dense finish, free from blemishes including trowel marks. In lieu of hand finishing, a power finishing machine approved in advance of use by the Contracting Officer may be used in accordance with direcions of the machine manufacturer. Additional troweling shall be performed, either by hand or machine, until the surface has been troweled 2 times, with a sufficient waiting period between each troweling. Care shall be taken to prevent blistering and if such occurs, troweling shall immediately be stopped and operations and surfaces corrected. A final hard steel troweling shall be done by hand with the trowel tipped using hard pressure when the surface is at a point that the trowel wil produce a ringing sound. The finshed surface shall be thoroughly consolidated and shall be essentially free of trowel marks and be uniform in texture and appearance. The concrete mixture used for trowel-finished areas shall be adjusted if necessary in order to provide sufficient fines (cementitious material and fine sand) to finish properly.

3.9.4 Broomed Finish

All walking surfaces shall be given a broomed finish. After floating, the surface shall be lightly steel troweled, then carefully scored by pulling a hair or coarse fiber push-type broom across the surface. Brooming shall be transverse to traffic or at right angles to the slope of the slab. After the end of the curing period, the surface shall be vigorously broomed with a coarse fiber broom to remove all loose or semi-detached particles.

3.10 EXTERIOR SLAB AND RELATED ITEMS

3.10.1 Pavements (Includes Above-Grade Channel)

Pavements shall be constructed where shown on the drawings. After forms are set and underlying material prepared as specified, the concrete shall be placed uniformly throughout the area and thoroughly vibrated. As soon as placed and vibrated, the concrete shall be struck off and screeded to the crown and cross section and to such elevation above grade that when consolidated and finished, the surface of the pavement will be at the required elevation. The entire surface shall be tamped with the strike off, or consolidated with a vibrating screed, and this operation continued until the required compaction and reduction of internal and surface voids are accomplished. Care shall be taken to prevent bringing excess paste to the surface. Immediately following the final consolidation of the surface, the pavement shall be floated longitudinally from bridges resting on the side forms and spanning but not touching the concrete. If necessary, additional concrete shall be placed and screeded, and the float operated until a satisfactory surface has been produced. The floating operation shall be advanced not more than half the length of the float and then continued over the new and previously floated surfaces. After finishing is completed but while the concrete is still plastic, minor irregularities and score marks in the pavement surface shall be eliminated by means of long-handled cutting straightedges. Straightedges shall be 12 feet in length and shall be operated from the sides of the pavement and from bridges. A straightedge operated from the side of the pavement shall be equipped with a handle 3 feet longer than one-half the width of the pavement. The surface shall then be tested for trueness with a 12 foot straightedge held in successive positions parallel and at right angles to the center line of the pavement, and the whole area covered as necessary to detect variations. The straightedge shall be advanced along the pavement

in successive stages of not more than one-half the length of the straightedge. Depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. Projections above the required elevation shall also be struck off and refinished. The straightedge testing and finishing shall continue until the entire surface of the concrete is true. Before the surface sheen has disappeared and well before the concrete becomes nonplastic, the surface of the pavement shall be given a nonslip sandy surface texture by use of a burlap drag. A strip of clean, wet burlap from 3 to 5 feet wide and 2 feet longer than the pavement width shall be carefully pulled across the surface. Edges and joints shall be rounded with an edger having a radius of 1/8 inch. Curing shall be as specified.

3.10.2 Sidewalks

Concrete shall be 4 inches minimum thickness. Contraction joints shall be provided at 5 feet spaces unless otherwise indicated. Contraction joints shall be cut 1 inch deep with a jointing tool after the surface has been finished. Transverse expansion joints 1/2 inch thick shall be provided at changes in direction and where sidewalk abuts curbs, steps, rigid pavement, or other similar structures. Sidewalks shall be given a lightly broomed finish. A transverse slope of 1/4 inch per foot shall be provided, unless otherwise indicated. Variations in cross section shall be limited to 1/4 inch in 5 feet.

3.10.3 Curbs and Gutters

Concrete shall be formed, placed, and finished by hand using a properly shaped "mule" or constructed using a slipform machine specially designed for this work. Contraction joints shall be cut 3 inches deep with a jointing tool after the surface has been finished. Expansion joints (1/2 inch wide) shall be provided at 100 feetmaximum spacing unless otherwise indicated. Exposed surfaces shall be finished using a stiff bristled brush.

3.11 CURING AND PROTECTION

3.11.1 General

Concrete shall be cured by an approved method for the period of time given below:

Concrete with Type III cement	3 days
All other concrete	7 days

Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, mechanical injury and damage from rain and flowing water for the duration of the curing period. Air and forms in contact with concrete shall be maintained at a temperature above 50 degrees F for the first 3 days and at a temperature above 32 degrees F for the remainder of the specified curing period. Exhaust fumes from combustion heating units shall be vented to the outside of the enclosure, and heaters and ducts shall be placed and directed so as not to cause areas of overheating and drying of concrete surfaces or to create fire hazards. Materials and equipment needed for adequate curing and protection shall be available and at the site prior to placing concrete. No fire or excessive heat, including welding, shall be permitted near or in direct contact with the concrete at any time. Except as otherwise permitted by paragraph Membrane Forming Curing Compounds, moist curing shall be provided for any areas to receive floor hardener, any

paint or other applied coating, or to which other concrete is to be bonded. Concrete containing silica fume shall be initially cured by fog misting during finishing, followed immediately by continuous moist curing. Except for plastic coated burlap, impervious sheeting alone shall not be used for curing.

3.11.2 Moist Curing

Concrete to be moist-cured shall be maintained continuously wet for the entire curing period, commencing immediately after finishing. If water or curing materials used stain or discolor concrete surfaces which are to be permanently exposed, the concrete surfaces shall be cleaned as approved. When wooden forms are left in place during curing, they shall be kept wet at all times. If steel forms are used in hot weather, nonsupporting vertical forms shall be broken loose from the concrete soon after the concrete hardens and curing water continually applied in this void. If the forms are removed before the end of the curing period, curing shall be carried out as on unformed surfaces, using suitable materials. Surfaces shall be cured by ponding, by continuous sprinkling, by continuously saturated burlap or cotton mats, or by continuously saturated plastic coated burlap. Burlap and mats shall be clean and free from any contamination and shall be completely saturated before being placed on the concrete. The Contractor shall have an approved work system to ensure that moist curing is continuous 24 hours per day.

3.11.3 Membrane Forming Curing Compounds

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. All surfaces shall be thoroughly moistened with water. Curing compound shall be applied to slab surfaces as soon as the bleeding water has disappeared, with the tops of joints being temporarily sealed to prevent entry of the compound and to prevent moisture loss during the curing period. The curing compound shall be applied in a two-coat continuous operation by approved motorized power-spraying equipment operating at a minimum pressure of 75 psi, at a uniform coverage of not more than 400 square feet per gallon for each coat, and the second coat shall be applied perpendicular to the first 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 specified. Surfaces on which clear compound is used shall be shaded from direct rays of the sun for the first 3 days. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic, and from other sources of abrasion and contamination during the curing period.

3.11.4 Ponding or Immersion

Concrete shall be continually immersed throughout the curing period. Water shall not be more than 20 degrees F less than the temperature of the concrete.

3.11.5 Cold Weather Curing and Protection

When the daily ambient low temperature is less than 32 degrees F the temperature of the concrete shall be maintained above 40 degrees F for the first seven days after placing. 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 degrees F as determined by suitable temperature measuring devices furnished by the Contractor, as required, and installed adjacent to the concrete surface and 2 inches inside the surface of the concrete. The installation of the thermometers shall be made by the Contractor as directed.

3.12 BEDDING MORTAR AND GROUT

3.12.1 Damp-Pack Bedding Mortar

Damp-pack bedding mortar shall consist of 1 part cement and 2-1/2 parts fine aggregate having water content such that a mass of mortar tightly squeezed in the hand will retain its shape but will crumble when disturbed. The space between the top of the concrete and bottom of the bearing plate or base shall be packed with the bedding mortar by tamping or ramming with a bar or rod until it is completely filled.

3.12.2 Nonshrink Grout

Nonshrink grout shall be a ready-mixed material requiring only the addition of water. Water content shall be the minimum that will provide a flowable mixture and completely fill the space to be grouted without segregation, bleeding, or reduction of strength.

3.12.2.1 Mixing and Placing of Nonshrink Grout

Mixing and placing shall be in conformance with the material manufacturer's instructions and as specified therein. Ingredients shall be thoroughly dry-mixed before adding water. After adding water, the batch shall be mixed for 3 minutes. Batches shall be of size to allow continuous placement of freshly mixed grout. Grout not used within 30 minutes after mixing shall be discarded. The space between the top of the concrete or machinery-bearing surface and the plate shall be filled solid with the grout. Forms shall be of wood or other equally suitable material for completely retaining the grout on all sides and on top and shall be removed after the grout has set. The placed grout shall be carefully worked by rodding or other means to eliminate voids; however, overworking and breakdown of the initial set shall be avoided. Grout shall not be retempered or subjected to vibration from any source. Where clearances are unusually small, placement shall be under pressure with a grout pump. Temperature of grout and surfaces to receive grout shall be maintained at 65 to 85 degrees F until after setting.

3.12.3 Mixing and Placing of Fiber-Reinforced Grout

Prior to placement of fiber-reinforced grout, stone boulders shall be thoroughly moistened and any excess of fines shall be sluiced to the underside of the stone blanket prior to grouting.

3.12.3.1 General Requirements

Grout shall be delivered to the place of final deposit by a low pressure grout pump with a pressure of less than 10 psi using a 2-inch diameter nozzle. A concrete pump truck system is acceptable provided the pump pressure can be altered to provide the necessary slow delivery amounts. Penetration of grout into riprap and between stone boulders shall be accomplished using a pencil vibrator. The top surface of riprap and stone boulders shall be left exposed above the grout surface as shown on the drawings. After placement, all exposed riprap or stone boulders with grout

splashed on the surface shall be cleaned with a wet broom. All grout between riprap or stone boulders shall be finished with a broom finish. Any holes or voids evident after vibrating or brooming shall be filled with grout. All grout shall be sprayed with a clear liquid membrane curing compound meeting requirements of ASTM C 309. If rocks cannot be cleaned of grout, a solution of muriatic acid shall be used to clean exposed riprap and stone boulders.

3.12.3.2 Cold Weather Placement

When depositing grout when the mean daily temperatures are below 40 degrees F, recommendations in ACI 306 shall be followed. Grout temperature shall be maintained at a minimum of 55 degrees F for sections having a thickness of 12 inches or greater, for not less than 72 hours after deposition of grout. Grout shall not be placed without written approval of the Contracting Officer on days when the temperature at 9:00 a.m. is below 30 degrees F. No grout shall be placed on snow, ice, frozen material, unsuitable material, or in water.

3.12.3.3 Hot Weather Placement

When depositing grout during periods of hot weather, recommendations in ACI 305 shall be followed. Grout temperature at the time of placement shall not exceed 90 degrees F. The Contractor shall protect grout immediately following placement to prevent rapid drying. Finishing and curing shall start as soon as possible after placement. Water-reducing, retarding admixtures may be used provided they meet all requirements of this specification. Continuous wetting or fog sprays may be required by the Contracting Officer for at least 24-hours after depositing grout, or the Contracting Officer may restrict work to evening hours during periods of hot weather.

3.13 TESTING AND INSPECTION FOR CONTRACTOR QUALITY CONTROL

The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and shall submit specified reports. When, in the opinion of the Contracting Officer, the concreting operation is out of control, concrete placement shall cease and the operation shall be corrected. The laboratory performing the tests shall be onsite and shall conform with ASTM C 1077. Materials may be subjected to check testing by the Government from samples obtained at the manufacturer, at transfer points, or at the project site. The Government may inspect the laboratory, equipment, and test procedures prior to start of concreting operations for conformance with ASTM C 1077.

3.13.1 Grading and Corrective Action

3.13.1.1 Fine Aggregate

At least once during each shift when the concrete plant is operating, there shall be one sieve analysis and fineness modulus determination in accordance with ASTM C 136 and COE CRD-C 104 for the fine aggregate or for each fine aggregate if it is batched in more than one size or classification. The location at which samples are taken may be selected by the Contractor as the most advantageous for control. However, the Contractor is responsible for delivering fine aggregate to the mixer within specification limits. When the amount passing on any sieve is outside the specification limits, the fine aggregate shall be immediately resampled and

retested. If there is another failure on any sieve, the fact shall immediately reported to the Contracting Officer, concreting shall be stopped, and immediate steps taken to correct the grading.

3.13.1.2 Coarse Aggregate

At least once during each shift in which the concrete plant is operating, there shall be a sieve analysis in accordance with ASTM C 136 for each size 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 shall be responsible for delivering the aggregate to the mixer within specification limits. A test record of samples of aggregate taken at the same locations shall show the results of the current test as well as the average results of the five most recent tests including the current test. The Contractor may adopt limits for control coarser than the specification limits for samples taken other than as delivered to the mixer to allow for degradation during handling. When the amount passing any sieve is outside the specification limits, the coarse aggregate shall be immediately resampled and retested. If the second sample fails on any sieve, that fact shall be reported to the Contracting Officer. Where two consecutive averages of 5 tests are outside specification limits, the operation shall be considered out of control and shall be reported to the Contracting Officer. Concreting shall be stopped and immediate steps shall be taken to correct the grading.

3.13.2 Quality of Aggregates

Thirty days prior to the start of concrete placement, the Contractor shall perform all tests for aggregate quality required by ASTM C 33. In addition, after the start of concrete placement, the Contractor shall perform tests for aggregate quality at least every three months, and when the source of aggregate or aggregate quality changes. Samples tested after the start of concrete placement shall be taken immediately prior to entering the concrete mixer.

3.13.3 Scales, Batching and Recording

The accuracy of the scales shall be checked by test weights prior to start of concrete operations and at least once every three months. Such tests shall also be made as directed whenever there are variations in properties of the fresh concrete that could result from batching errors. Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. At the same time, the Contractor shall test and ensure that the devices for dispensing admixtures are operating properly and accurately. When either the weighing accuracy or batching accuracy does not comply with specification requirements, the plant shall not be operated until necessary adjustments or repairs have been made. Discrepancies in recording accuracies shall be corrected immediately.

3.13.4 Batch-Plant Control

The measurement of concrete materials including cementitious materials, each size of aggregate, water, and admixtures shall be continuously controlled. The aggregate weights and amount of added water shall be adjusted as necessary to compensate for free moisture in the aggregates. The amount of air-entraining agent shall be adjusted to control air content within specified limits. A report shall be prepared indicating type and

source of cement used, type and source of pozzolan or slag 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 batch aggregate and water weights per cubic yard for each class of concrete batched during each day's plant operation.

3.13.5 Concrete Mixture

a. Air Content Testing. Air content tests shall be made when test specimens are fabricated. In addition, at least two tests for air content shall be made on randomly selected batches of each separate concrete mixture produced 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 for normal weight concrete and ASTM C 173 for lightweight concrete. Test results shall be plotted on control charts which shall at all times be readily available to the Government and shall be submitted weekly. Copies of the current control charts shall be kept in the field by testing crews and results plotted as tests are made. When a single test result reaches either the upper or lower action limit, a second test shall immediately be made. The results of the two tests shall be averaged and this average used as the air content of the batch to plot on both the air content and the control chart for range, and for determining need for any remedial action. The result of each test, or average as noted in the previous sentence, shall be plotted on a separate control chart for each mixture on which an "average line" is set at the midpoint of the specified air content range from paragraph Air Entrainment. An upper warning limit and a lower warning limit line shall be set 1.0 percentage point above and below the average line, respectively. An upper action limit and a lower action limit line shall be set 1.5 percentage points above and below the average line, respectively. The range between each two consecutive tests shall be plotted on a secondary control chart for range where an upper warning limit is set at 2.0 percentage points and an upper action limit is set at 3.0 percentage points. Samples for air content may be taken at the mixer, however, the Contractor is responsible for delivering the concrete to the placement site at the stipulated air content. If the Contractor's materials or transportation methods cause air content loss between the mixer and the placement, correlation samples shall be taken at the placement site as required by the Contracting Officer, and the air content at the mixer controlled as directed.

b. Air Content Corrective Action. Whenever points on the control chart for percent air reach either warning limit, an adjustment shall immediately be made in the amount of air-entraining admixture batched. As soon as practical after each adjustment, another test shall be made to verify the result of the adjustment. Whenever a point on the secondary control chart for range reaches the warning limit, the admixture dispenser shall be recalibrated to ensure that it is operating accurately and with good reproducibility. Whenever a point on either control chart reaches an action limit line, the air content shall be considered out of control and the concreting operation shall immediately be halted until the air content is under control. Additional air content tests shall be made when concreting is restarted.

c. Slump Testing. In addition to slump tests which shall be made when test specimens are fabricated, at least four slump tests shall be made on randomly selected batches in accordance with ASTM C 143/C 143M for each separate concrete mixture produced during each 8-hour or less period of concrete production each day. Also, additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Test results shall be plotted on control charts which shall at all times be readily available to the Government and shall be submitted weekly. Copies of the current control charts shall be kept in the field by testing crews and results plotted as tests are made. When a single slump test reaches or goes beyond either the upper or lower action limit, a second test shall immediately be made. The results of the two tests shall be averaged and this average used as the slump of the batch to plot on both the control charts for slump and the chart for range, and for determining need for any remedial action. Limits shall be set on separate control charts for slump for each type of mixture. The upper warning limit shall be set at 1/2 inch below the maximum allowable slump specified in paragraph Slump in PART 1 for each type of concrete and an upper action limit line and lower action limit line shall be set at the maximum and minimum allowable slumps, respectively, as specified in the same paragraph. The range between each consecutive slump test for each type of mixture shall be plotted on a single control chart for range on which an upper action limit is set at 2 inches. Samples for slump shall be taken at the mixer. However, the Contractor is responsible for delivering the concrete to the placement site at the stipulated slump. If the Contractor's materials or transportation methods cause slump loss between the mixer and the placement, correlation samples shall be taken at the placement site as required by the Contracting Officer, and the slump at the mixer controlled as directed.

d. Slump Corrective Action. Whenever points on the control charts for slump reach the upper warning limit, an adjustment shall immediately be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the total water content does not exceed that amount allowed by the maximum w/c ratio specified, based on aggregates which are in a saturated surface dry condition. When a single slump reaches the upper or lower action limit, no further concrete shall be delivered to the placing site until proper adjustments have been made. Immediately after each adjustment, another test shall be made to verify the correctness of the adjustment. Whenever two consecutive individual slump tests, made during a period when there was no adjustment of batch weights, produce a point on the control chart for range at or above the upper action limit, the concreting operation shall immediately be halted, and the Contractor shall take appropriate steps to bring the slump under control. Additional slump tests shall be made as directed.

e. Temperature. The temperature of the concrete shall be measured when compressive strength specimens are fabricated. Measurement shall be in accordance with ASTM C 1064/C 1064M. The temperature shall be reported along with the compressive strength data.

f. Strength Specimens. At least one set of test specimens shall be

made, for compressive strength as appropriate, on each different concrete mixture placed during the day for each 500 cubic yards or portion thereof of that concrete mixture placed each day. Additional sets of test specimens shall be made, as directed by the Contracting Officer, when the mixture proportions are changed or when low strengths have been detected. A truly random (not haphazard) sampling plan shall be developed by the Contractor and approved by the Contracting Officer prior to the start of construction. The plan shall assure that sampling is done in a completely random and unbiased manner. A set of test specimens for concrete with a 28-day specified strength per paragraph Strength Requirements in PART 1 shall consist of four specimens, two to be tested at 7 days and two at 28 days. Test specimens shall be molded and cured in accordance with ASTM C 31/C 31M and tested in accordance with ASTM C 39/C 39M for test cylinders. Results of all strength tests shall be reported immediately to the Contracting Officer. Quality control charts shall be kept for individual strength "tests", ("test" as defined in paragraph Strength Requirements in PART 1) moving average of last 3 "tests" for strength, and moving average for range for the last 3 "tests" for each mixture. The charts shall be similar to those found in ACI 214.3R.

3.13.6 Inspection Before Placing

Foundations, construction joints, forms, and embedded items shall be inspected by the Contractor in sufficient time prior to each concrete placement 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.

3.13.7 Placing

The placing foreman shall supervise placing operations, shall determine that the correct quality of concrete or grout is placed in each location as specified and as directed by the Contracting Officer, and shall be responsible for measuring and recording concrete temperatures and ambient temperature hourly during placing operations, weather conditions, time of placement, volume placed, and method of placement. The placing foreman shall not permit batching and placing to begin until it has been verified that an adequate number of vibrators in working order and with competent operators are available. Placing shall not be continued if any pile of concrete is inadequately consolidated. If any batch of concrete fails to meet the temperature requirements, immediate steps shall be taken to improve temperature controls.

3.13.8 Vibrators

The frequency and amplitude of each vibrator shall be determined in accordance with COE CRD-C 521 prior to initial use and at least once a month when concrete is being placed. Additional tests shall be made as directed when a vibrator does not appear to be adequately consolidating the concrete. The frequency shall be determined while the vibrator is operating in concrete with the tachometer being held against the upper end of the vibrator head while almost submerged and just before the vibrator is withdrawn from the concrete. The amplitude shall be determined with the head vibrating in air. Two measurements shall be taken, one near the tip and another near the upper end of the vibrator head, and these results averaged. The make, model, type, and size of the vibrator and frequency

and amplitude results shall be reported in writing. Any vibrator not meeting the requirements of paragraph Consolidation, shall be immediately removed from service and repaired or replaced.

3.13.9 Curing Inspection

a. Moist Curing Inspections. At least once each shift, and not less than twice per day on both work and non-work days, an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded.

b. Moist Curing Corrective Action. When a daily inspection report lists an area of inadequate curing, immediate corrective action shall be taken, and the required curing period for those areas shall be extended by 1 day.

c. Membrane Curing Inspection. No curing compound shall be applied until the Contractor has verified that the compound is properly mixed and ready for spraying. At the end of each operation, the Contractor shall estimate the quantity of compound used by measurement of the container and the area of concrete surface covered, shall compute the rate of coverage in square feet per gallon, and shall note whether or not coverage is uniform.

d. Membrane Curing Corrective Action. When the coverage rate of the curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

e. Sheet Curing Inspection. At least once each shift and once per day on non-work days, 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.

f. Sheet Curing Corrective Action. When a daily inspection report lists any tears, holes, or laps or 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 1 day.

3.13.10 Cold-Weather Protection

At least once each shift and once per day on non-work days, an inspection shall be made of all areas subject to cold-weather protection. Any deficiencies shall be noted, corrected, and reported.

3.13.11 Mixer Uniformity

a. Stationary Mixers. Prior to the start of concrete placing and once every 6 months when concrete is being placed, or once for every 75,000 cubic yards of concrete placed, whichever results in the shortest time interval, uniformity of concrete mixing shall be determined in accordance with ASTM C 94/C 94M.

b. Truck Mixers. Prior to the start of concrete placing and at least once every 6 months when concrete is being placed, uniformity of concrete mixing shall be determined in accordance with ASTM C 94/C 94M. 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 the blades may be regarded as satisfactory.

c. Mixer Uniformity Corrective Action. When a mixer fails to meet mixer uniformity requirements, either the mixing time shall be increased, batching sequence changed, batch size reduced, or adjustments shall be made to the mixer until compliance is achieved.

3.13.12 Reports

All results of tests or inspections conducted shall be reported informally as they are completed and in writing daily. A weekly report shall be prepared for 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.

3.18 Concrete Coloring

The concrete coloring shall be mixed into the concrete as per the manufacturer's recommendations. Follow manufacturer's guidance for specific curing additive requirments.

3.18 Graffiti Coating

The coating shall be applied in accordance with the manufacturer's recommended procedures. The coatings shall be applied at a the rate of 600 square feet per gallon. Four coats are recommended.

-- End of Section --

SECTION 05055

METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS
12/92; Omaha Update: 04/02

PART 1. GENERAL

1.1 REFERENCES

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

STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO [CDOH] - STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1999 EDITION.

CDOH	Section 606	Guardrail
CDOH	Section 710	Fence and Guardrail
CDOH	Section 708	Paints

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

\-ASTM A 36-\	(2000a) Carbon Structural Steel
\-ASTM A 53-\	(2001) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
\-ASTM A 123-\	(2001) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
\-ASTM A 283-\	(2000) Low and Intermediate Tensile Strength Carbon Steel Plates
\-ASTM A 500-\	(1999) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
\-ASTM A 653-\	(2000) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
\-ASTM A 924-\	(1995) General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
\-ASTM B 117-\	(1997) Operating Salt Spray (Fog)Apparatus
\-ASTM D 822-\	(2001) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
\-ASTM D 1734-\	(1993 R 1998)Standard Practice for Making Cementitious Panels for Testing Coatings
\-ASTM D 2247-\	(1999) Testing Water Resistance of Coatings in 100% Relative Humidity
\-ASTM D 2454-\	(1995 R 2002) Determining the Effect of Overbaking on Organic Coatings

\-ASTM D 2794-\	(1993 R 1999e1) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation
\-ASTM D 3363-\	(2000) Test Method for Film Harndess by Pencil Test
\-ASTM D 3359-\	(1997) Test Method for Measuring Adhesion by Tape Test

AMERICAN WELDING SOCIETY (AWS)

\-AWS D1.1-\	(2001) Structural Welding Code - Steel
\-AWS A2.4-\	(1998) Standard&\ Symbols for Welding, Brazing and Nondestructive Examination
\-AWS A3.0-\	(2001) Standard Welding Terms and Definitions
\-AWS Z49.1-\	(1999) Safety in Welding and Cutting&\

1.2 DEFINITIONS

Definitions of welding terms shall be in accordance with \-AWS A3.0-\.

1.2.1 METALWORK FABRICATION AND MACHINE WORK

1.2.1.1 Submittals

Submittals must be limited to those necessary for adequate quality control. Importance of an item on the project should be one of the primary factors in detemining if a submittal for the items should be required. Detail drawings for metalwork and machine work shall be submitted and approved prior to fabrication.

1.2.2 FABRICATION

1.2.2.1 Structural Fabrication

Material must be straight before being laid off or worked. If straightening is necessary it shall be done by methods that will not impair the metal. Sharp kinks or bends shall be cause for rejection of the material. Material with welds will not be accepted except where welding is definitely specified, indicated or otherwise approved. Bends shall be made by approved dies, press brakes or bending rolls. Where heating is required, precautions shall be taken to avoid overheating the metal and it shall be allowed to cool in a manner that will not impair the original properties of the metal. Proposed flame cutting of material other than structural steel shall be subject to approval and shall be indicated on detail drawings. Shearing shall be accurate and all portions of the work shall be neatly finished. Corners shall be square and true unless otherwise shown. Re-entrant cuts shall be filleted to a minimum radius of 3/4 inch unless otherwise approved. Finished members shall be free of twists, bends and open joints. Bolts, nuts and screws shall be tight.

1.2.2.2 Dimensional Tolerances for Metal Work

Dimensions shall be measured by an approved calibrated steel tape of approximately the same temperature as the material being measured. The overall dimensions of an assembled structural unit shall be within the tolerances indicated on the drawings or as specified in the particular section of these specifications for the item of work. Where tolerances are not specified in other sections of these specifications or shown, an allowable variation of 1/32 inch is permissible in the overall length of component members with both ends milled and component members without milled ends shall not deviate from the dimensions shown

by not more than 1/16 inch for members 30 feet or less in length and by more than 1/8 inch for members over 30 feet in length.

1.2.2.3 Steel Fabrication
Steel may be cut by mechanically guided or hand-guided torches, provided an accurate profile with a surface that is smooth and free from cracks and notches is obtained. Surfaces and edges to be welded shall be prepared in accordance with AWS D1.1, Subsection 3.2. Where structural steel is not to be welded, chipping or grinding will not be required except as necessary to remove slag and sharp edges of mechanically guided or hand-guided cuts not exposed to view. Hand-guided cuts which are to be exposed or visible shall be chipped, ground or machined to sound metal.

1.3 WELDING

1.3.1 QUALIFICATION OF WELDERS AND WELDING OPERATORS
The Contractor shall certify that the qualification of welders and welding operators and tack welders who will perform structural steel welding have been qualified for the particular type of work to be done in accordance with the requirements of this section, prior to commencing fabrication.

1.3.2
The design of welded connections shall conform to \-AISC-04-\ unless otherwise indicated or specified. Material with welds will not be accepted unless the welding is specified or indicated on the drawings or otherwise approved. Welding shall be as specified in this section, except where additional requirements are shown on the drawings or are specified in other sections. Welding shall not be started until welding procedures, welders, welding operators, and tackers have been qualified and the submittals approved by the Contracting Officer. Qualification testing shall be performed at or near the work site. Each Contractor performing welding shall maintain records of the test results obtained in welding procedure, welder, welding operator, and tacker performance qualifications.

1.3.3 Prequalified Procedures
Welding procedures which are considered prequalified as specified in \-AWS D1.1-\ will be accepted without further qualification. The Contractor shall submit for approval a listing or an annotated drawing to indicate the joints not prequalified. Procedure qualification shall be required for these joints.

1.3.4 Retests
If welding procedure fails to meet the requirements of \-AWS D1.1-\, the procedure specification shall be revised and requalified, or at the Contractor's option, welding procedure may be retested in accordance with \-AWS D1.1-\. If the welding procedure is qualified through retesting, all test results, including those of test welds that failed to meet the requirements, shall be submitted with the welding procedure.

1.3.5 Previous Qualifications
At the discretion of the Contracting Officer, welders, welding operators, and tackers qualified by test within the previous 6 months may be accepted for this contract without requalification if all the following conditions are met:

a. Copies of the welding procedure specifications, the procedure qualification test records, and the welder, welding operator, and tacker qualification test records are submitted and approved in accordance with the specified requirements for detail drawings.

b. Testing was performed by an approved testing laboratory, technical consultant, or the Contractor's approved quality control organization.

c. The previously qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions encountered under this contract.

d. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this contract.

1.3.6 Certificates

Before assigning any welder, welding operator, or tacker to work under this contract, the Contractor shall submit the names of the welders, welding operators, and tackers to be employed, and certification that each individual is qualified as specified. The certification shall state the type of welding and positions for which the welder, welding operator, or tacker is qualified, the code and procedure under which the individual is qualified, the date qualified, and the name of the firm and person certifying the qualification tests. The certification shall be kept on file, and 3 copies shall be furnished. The certification shall be kept current for the duration of the contract.

1.3.7 Renewal of Qualification

Requalification of a welder or welding operator shall be required under any of the following conditions:

a. It has been more than 6 months since the welder or welding operator has used the specific welding process for which he is qualified.

b. There is specific reason to question the welder or welding operator's ability to make welds that meet the requirements of these specifications.

c. The welder or welding operator was qualified by an employer other than those firms performing work under this contract, and a qualification test has not been taken within the past 12 months. Records showing periods of employment, name of employer where welder, or welding operator, was last employed, and the process for which qualified shall be submitted as evidence of conformance.

d. A tacker who passes the qualification test shall be considered eligible to perform tack welding indefinitely in the positions and with the processes for which he is qualified, unless there is some specific reason to question the tacker's ability. In such a case, the tacker shall be required to pass the prescribed tack welding test.

1.3.8 Welding of Structural Steel

Approval of any welding procedure will not relieve the Contractor of the responsibility for producing a finished structure meeting all requirements of these specifications. The Contractor will be directed or authorized to make any changes in previously approved welding procedures that are deemed necessary or desirable by the Contractor Officer. The Contractor shall submit a complete schedule of welding procedures for each steel structure to be welded. The schedule shall conform to the requirements specified in the provisions

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having no designation are for information only. The following shall be submitted in accordance with Section \=01300=\ SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings; G-DO

Detail drawings for metalwork and machine work shall be submitted and approved prior to fabrication.

SD-07 Certificates

Welding Procedure Qualifications; G-AO
Welder, Welding Operator, and Tacker Qualification; G-AO
Inspector Qualification; G-AO.

Copies of the welding procedure specifications; the procedure qualification test records; and the welder, welding operator, or tacker qualification test records.

SD-06 Test Reports

Quality Control; G-AO.

A quality assurance plan and records of tests and inspections.

SD-03 Product Data

Miscellaneous Metal Items; G-AO.

Detail drawings indicating material thickness, type, grade, and class; dimensions; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates. Detail drawings for the following items: Handrails and guardrails.

SD-04 Samples

Miscellaneous Metal Items; G-AO.

Samples shall be full size, taken from manufacturer's stock, and shall be complete as required for installation in the structure. Samples may be installed in the work, provided each sample is clearly identified and its location recorded.

1.5 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with \-AWS D1.1-\. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with \-ASTM A 123-\, \-ASTM A 653-\, or \-ASTM A 924-\, as applicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

1.6 DISSIMILAR MATERIALS

Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall unless otherwise specified be protected with a coat of bituminous paint or asphalt varnish.

1.7 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines

and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be flush. Where tight fits are required, joints shall be milled. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

1.8 ANCHORAGE

Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; and lag bolts and screws for wood.

PART 2. PRODUCTS

2.1 ALUMINUM FINISHES

Unless otherwise specified, aluminum items shall have standard mill finish, hand sanded or machine finish to a 240 grit.. The thickness of the coating shall be not less than that specified for protective and decorative type finishes for items used in interior locations or architectural Class I type finish for items used in exterior locations in \-AA DAF-45-\. \Aluminum surfaces to be in contact with plaster or concrete during construction shall be protected with a field coat of \-CID A-A 344A-\.

2.2 SHOP PAINTING

Surfaces of ferrous metal except galvanized surfaces, shall be cleaned and shop coated with the manufacturer's standard protective coating unless otherwise specified. Surfaces of items to be embedded in concrete shall not be painted. Items to be finish painted shall be prepared according to manufacturer's recommendations or as specified.

2.2.1 COLOR POWDER COAT

Provide grease and dirt free metal fabrication. Thoroughly wash and clean all surfaces to be coated. Sand blast (silica) roughen all exposed surfaces. Plug or mask all threaded male or female connections and all openings or areas that are to remain uncoated.

2.2.1.1

Paint shall be an electrostatically applied polyester powder coating which shall be cured at temperatures between 400 (204□ C) and 500 (260□ C) degrees Fahrenheit. The polyester powder shall comply with the following standards: ASTM D 1734; ASTM D 2794; ASTM B 117; ASTM D 2247; ASTM D 822; ASTM D 3363; ASTM D 2454; ASTM D 3359B.

2.2.1.2

Finish will be 1.5 mil to 5 mil thickness with no surface imperfections, fading or flat spots. Color will have a uniform appearance with no surface beads, cracks or bubbles. Coverage will be 100% and the finish (whether gloss, matt wrinkle, etc.) uniform throughout.

2.3 PIPE COLLARS

Pipe collars shall be heavy duty steel pipe conforming to \-ASTM A 53-\ or structural tubing conforming to \-ASTM A 500-\, Grade A or B of equivalent strength.

2.4 GUARDRAIL
This work shall consist of the fabrication, assembly, and installation of guardrail, guardrail transitions, and guardrail end treatments, in accordance with these requirements, and as shown on the contract drawings. This work may also consist of the extension of existing guardrail with new guardrail, the removal of existing guardrail, or adjusting the height of existing guardrail. Guardrail shall conforma to CDOH Section 606; 710 and 708.

2.5 HANDRAILS
Handrails shall be designed to resist a concentrated load of \~200 pounds~\ in any direction at any point of the top of the rail or \~20 pounds per foot~\ applied horizontally to top of the rail, whichever is more severe.

2.5.1 Steel Handrails, Including Carbon Steel Inserts

Steel handrails, including inserts in concrete, shall be steel pipe conforming to \-ASTM A 53-\ or structural tubing conforming to \-ASTM A 500-\, Grade A or B of equivalent strength. Steel railings shall be \2 inch~\ nominal size. Railings shall be shop painted. Pipe collars shall be steel, or hot-dip galvanized steel.

a. Fabrication: Joint posts, rail, and corners shall be fabricated by one of the following methods:

(1) Flush type rail fittings of commercial standard, welded and ground smooth with railing splice locks secured with \~3/8 inch~\ hexagonal recessed-head setscrews.

(2) Mitered and welded joints by fitting post to top rail and intermediate rail to post, mitering corners, groove welding joints, and grinding smooth. Railing splices shall be butted and reinforced by a tight fitting interior sleeve not less than \~6 inches~\ long.

(3) Railings may be bent at corners in lieu of jointing, provided bends are made in suitable jigs and the pipe is not crushed.

b. Removable sections, toe-boards, and brackets shall be provided as indicated.

2.6 MISCELLANEOUS
Miscellaneous plates and shapes for items that do not form a part of the framework, such as miscellaneous mountings, brackets and frames, shall be provided to complete the work.

PART 3. EXECUTION

3.1 GENERAL REQUIREMENTS
All items shall be installed at the locations shown and according to the manufacturer's recommendations. Items listed below require additional procedures as specified.

3.2 Installation of Guardrail
Installation of guardrail shall be in accordance with CDOH Sections 606 and 710.

3.3 ATTACHMENT OF HANDRAILS
Toeboards and brackets shall be installed where indicated. Splices, where required, shall be made at expansion joints. Removable sections shall be installed as indicated.

3.3.1 Installation of Steel Handrails

Installation shall be as indicated. Rail ends shall be secured by steel flanges anchored by expansion shields and through bolted to a back plate or by \~1/4 inch~\ lag bolts to studs or solid backing.

SECTION TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16375A

ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND

05/01

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.2.1 Terminology
1.2.2 Service Conditions
1.3 SUBMITTALS
1.4 DELIVERY, STORAGE, AND HANDLING
1.5 EXTRA MATERIALS

PART 2 PRODUCTS

2.1 STANDARD PRODUCT
2.2 NAMEPLATES
2.2.1 General
2.3 CORROSION PROTECTION
2.3.1 Aluminum Materials
2.3.2 Ferrous Metal Materials
2.3.2.1 Hardware
2.3.2.2 Equipment
2.3.3 [Enter Appropriate Subpart Title Here]
2.4 CABLES
2.4.1 NOT USED
2.4.2 Low-Voltage Cables
2.4.2.1 Conductor Material
2.4.2.2 Insulation
2.4.2.3 Jackets
2.4.2.4 Direct Buried
2.4.2.5 In Duct
2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS
2.5.1 NOT USED
2.5.2 NOT USED
2.5.3 Low-Voltage Cable Splices
2.6 CONDUIT AND DUCTS
2.6.1 Metallic Conduit
2.6.2 Nonmetallic Ducts
2.6.2.1 NOT USED
2.6.2.2 Concrete Encased Ducts
2.6.2.3 Direct Burial
2.6.3 Conduit Sealing Compound
2.7 MANHOLES, HANDHOLES, AND PULLBOXES
2.8 NOT USED
2.9 NOT USED
2.10 PROTECTIVE DEVICES
2.10.1 Circuit Breakers, Low-Voltage
2.10.1.1 NOT USED

2.10.1.2 Molded-Case Circuit Breakers
2.10.2 NOT USED
2.10.3 Fuses, Low-Voltage, Including Current-Limiting
2.10.3.1 Cartridge Fuses
2.11 NOT USED
2.12 GROUNDING AND BONDING
2.12.1 Driven Ground Rods
2.12.2 Grounding Conductors
2.13 CONCRETE AND REINFORCEMENT
2.14 NOT USED
2.15 NOT USED
2.16 LIQUID DIELECTRICS

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS
3.1.1 Conformance to Codes
3.1.2 Verification of Dimensions
3.1.3 Disposal of Liquid Dielectrics
3.2 CABLE INSTALLATION
3.2.1 Cable Installation Plan and Procedure
3.2.1.1 Cable Inspection
3.2.1.2 Duct Cleaning
3.2.1.3 Duct Lubrication
3.2.1.4 Cable Installation
3.2.1.5 Cable Installation Plan
3.2.2 Duct Line
3.2.3 Direct-Burial
3.2.3.1 Trenching
3.2.3.2 Cable Burial
3.2.3.3 Other Requirements
3.2.3.4 Low-Voltage Cable Splices
3.2.3.5 Cable Markers
3.3 CABLE JOINTS
3.4 NOT USED
3.5 DUCT LINES
3.5.1 Requirements
3.5.2 Treatment
3.5.3 Concrete Encasement
3.5.4 Nonencased Direct-Burial
3.5.5 Installation of Couplings
3.5.5.1 NOT USED
3.5.5.2 Plastic Duct
3.5.6 Duct Line Markers
3.6 HANDHOLES, AND PULLBOXES
3.6.1 General
3.6.2 NOT USED
3.6.3 NOT USED
3.6.4 Handholes
3.6.5 Pullboxes
3.6.6 Ground Rods
3.7 PAD-MOUNTED EQUIPMENT INSTALLATION
3.7.1 Concrete Pads
3.7.1.1 Construction
3.7.1.2 Concrete and Reinforcement
3.7.1.3 Sealing
3.7.2 Padlocks
3.8 NOT USED
3.9 CONNECTIONS TO BUILDINGS

3.10 GROUNDING
3.10.1 Grounding Electrodes
3.10.2 Grounding and Bonding Connections
3.10.3 Grounding and Bonding Conductors
3.10.4 NOT USED
3.10.5 Handhole, or Concrete Pullbox Grounding
3.11 FIELD TESTING
3.11.1 General
3.11.2 Safety
3.11.3 Ground-Resistance Tests
3.11.4 Ground-Mat Connection Inspection
3.11.5 NOT USED
3.11.6 Low-Voltage Cable Test
3.11.7 NOT USED
3.11.8 NOT USED
3.11.9 Circuit Breaker Tests
3.11.10 NOT USED
3.11.11 NOT USED
3.11.12 Pre-Energization Services
3.11.13 Operating Tests
3.12 MANUFACTURER'S FIELD SERVICE
3.12.1 Onsite Training
3.12.2 Installation Engineer
3.13 ACCEPTANCE

-- End of Section Table of Contents --

SECTION 16375A

ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
05/01

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C80.1	(1995) Rigid Steel Conduit - Zinc Coated
ANSI C119.1	(1986; R 1997) Sealed Insulated Underground Connector Systems Rated 600 Volts

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 48	(1994ael) Gray Iron Castings
ASTM A 123/A 123M	(2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(2000) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B 3	(1995) Soft or Annealed Copper Wire
ASTM B 8	(1999) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM C 478	(1997) Precast Reinforced Concrete Manhole Sections
ASTM C 478M	(1997) Precast Reinforced Concrete Mahhole Sections (Metric)
ASTM D 923	(1997) Sampling Electrical Insulating Liquids
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(1997) National Electrical Safety Code
IEEE Std 100	(1997) IEEE Standard Dictionary of Electrical and Electronics Terms

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA AB 1	(1993) Molded Case Circuit Breakers and Molded Case Switches
NEMA FB 1	(1993) Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
NEMA FU 1	(1986) Low Voltage Cartridge Fuses
NEMA TC 5	(1990) Corrugated Polyolefin Coilable Plastic Utilities Duct
NEMA TC 6	(1990) PVC and ABS Plastic Utilities Duct for Underground Installation
NEMA TC 7	(1990) Smooth-Wall Coilable Polyethylene Electrical Plastic Duct

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2002) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 6	(1997) Rigid Metal Conduit
UL 198C	(1986; Rev thru Feb 1998) High-Interrupting-Capacity Fuses, Current-Limiting Types
UL 198E	(1988; Rev Jul 1988) Class R Fuses
UL 198H	(1988; Rev thru Nov 1993) Class T Fuses
UL 467	(1993; Rev thru Apr 1999) Grounding and Bonding Equipment
UL 486A	(1997; Rev thru Dec 1998) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 489	(1996; Rev thru Dec 1998) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
UL 514A	(1996; Rev Dec 1999) Metallic Outlet Boxes

UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit
UL 854	(1996; Rev Oct 1999) Service-Entrance Cables
UL 1242	(1996; Rev Mar 1998) Intermediate Metal Conduit

1.2 GENERAL REQUIREMENTS

1.2.1 Terminology

Terminology used in this specification is as defined in IEEE Std 100.

1.2.2 Service Conditions

Items provided under this section shall be specifically suitable for the following service conditions. .

a. Fungus Control

b. Altitude 6000 feet

c. Ambient Temperature 100 degrees F

d. Frequency

e. Ventilation

f. Seismic Parameters

g. Humidity Control

h. Corrosive Areas

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Electrical Distribution System; G-AO,

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams manufacturers standard installation drawings and other information necessary to define the installation and enable the Government to check conformity with the requirements of the contract drawings.

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures shall be included with the detail drawings. Approved departures shall be made at no additional cost to the Government.

Detail drawings shall show how components are assembled, function together and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not acceptable except where prior approval has been obtained from the Contracting Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall consist of the following:

a. Detail drawings showing physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. All optional items shall be clearly identified as included or excluded.

b. Internal wiring diagrams of equipment showing wiring as actually provided for this project. External wiring connections shall be clearly identified.

Detail drawings shall as a minimum depict the installation of the following items:

a. Medium-voltage cables and accessories including cable installation plan.

b. Transformers.

c. Substations.

d. Switchgear.

e. Pad-mounted loadbreak switches.

f. Busways.

g. Surge arresters.

As-Built Drawings; G-AO,

The as-built drawings shall be a record of the construction as installed. The drawings shall include the information shown on the contract drawings as well as deviations, modifications, and changes from the contract drawings, however minor. The as-built drawings shall be a full sized set of prints marked to reflect deviations, modifications, and changes. The as-built drawings shall be complete and show the location, size, dimensions, part identification, and other information. Additional sheets may be added. The as-built drawings shall be jointly inspected for accuracy and completeness by the Contractor's quality control representative and by the Contracting Officer prior to the submission of each monthly pay estimate. Upon completion of the work, the Contractor shall provide three full sized sets of the marked prints to the Contracting Officer for approval. If upon review, the as-built drawings are found to contain errors and/or

omissions, they will be returned to the Contractor for correction. The Contractor shall correct and return the as-built drawings to the Contracting Officer for approval within 10 calendar days from the time the drawings are returned to the Contractor.

SD-03 Product Data

Nameplates; G-AO,

Catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

Material and Equipment; G-AO,

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each such item.

General Installation Requirements; G-AO,

As a minimum, installation procedures for transformers, substations, switchgear, and medium-voltage cable terminations and splices.

Procedures shall include cable pulling plans, diagrams, instructions, and precautions required to install, adjust, calibrate, and test the devices and equipment.

SD-06 Test Reports

Factory Tests; G-AO,

Certified factory test reports shall be submitted when the manufacturer performs routine factory tests, including tests required by standards listed in paragraph REFERENCES. Results of factory tests performed shall be certified by the manufacturer, or an approved testing laboratory, and submitted within 7 days following successful completion of the tests. The manufacturer's pass-fail criteria for tests specified in paragraph FIELD TESTING shall be included.

Field Testing; G-AO,

A proposed field test plan, 30 days prior to testing the installed system. No field test shall be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

Operating Tests; G-AO,
Six copies of the information described below in 8-1/2 by 11 inch binders having a minimum of three rings, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

a. A list of equipment used, with calibration certifications.

b. A copy of measurements taken.

c. The dates of testing.

d. The equipment and values to be verified.

e. The condition specified for the test.

f. The test results, signed and dated.

g. A description of adjustments made.

Cable Installation; G-AO,
Six copies of the information described below in 8-1/2 by 11 inch binders having a minimum of three rings from which material may readily be removed and replaced, including a separate section for each cable pull. Sections shall be separated by heavy plastic dividers with tabs, with all data sheets signed and dated by the person supervising the pull.

a. Site layout drawing with cable pulls numerically identified.

b. A list of equipment used, with calibration certifications. The manufacturer and quantity of lubricant used on pull.

c. The cable manufacturer and type of cable.

d. The dates of cable pulls, time of day, and ambient temperature.

e. The length of cable pull and calculated cable pulling tensions.

f. The actual cable pulling tensions encountered during pull.

SD-07 Certificates

Material and Equipment; G-AO

Where materials or equipment are specified to conform to the standards of the Underwriters Laboratories (UL) or to be constructed or tested, or both, in accordance with the standards of the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers (IEEE), or the National Electrical Manufacturers Association (NEMA), the Contractor shall submit proof that the items provided conform to such requirements. The label of, or listing by, UL will be acceptable as evidence that the items conform. Either a certification or a published catalog specification data statement, to the effect that the item is in accordance with the referenced ANSI or IEEE standard, will be acceptable as evidence that the item conforms. A similar certification or published catalog specification data statement to the effect that the item is in accordance with the referenced NEMA standard, by a company listed as a member company of NEMA, will be acceptable as evidence that the item conforms. In lieu of such certification or published data, the Contractor may submit a certificate from a recognized testing agency equipped and competent to perform such services, stating that the items have been tested and that they conform to the requirements listed,

including methods of testing of the specified agencies. Compliance with above-named requirements does not relieve the Contractor from compliance with any other requirements of the specifications.

Cable Installer Qualifications; G-AO

The Contractor shall provide at least one onsite person in a supervisory position with a documentable level of competency and experience to supervise all cable pulling operations. A resume shall be provided showing the cable installers' experience in the last three years, including a list of references complete with points of contact, addresses and telephone numbers.

1.4 DELIVERY, STORAGE, AND HANDLING

Devices and equipment shall be visually inspected by the Contractor when received and prior to acceptance from conveyance. Stored items shall be protected from the environment in accordance with the manufacturer's published instructions. Damaged items shall be replaced. Oil filled transformers and switches shall be stored in accordance with the manufacturer's requirements. Wood poles held in storage for more than 2 weeks shall be stored in accordance with ANSI O5.1. Handling of wood poles shall be in accordance with ANSI O5.1, except that pointed tools capable of producing indentations more than 1 inch in depth shall not be used. Metal poles shall be handled and stored in accordance with the manufacturer's instructions.

1.5 EXTRA MATERIALS

One additional spare fuse or fuse element for each furnished fuse or fuse element shall be delivered to the contracting officer when the electrical system is accepted. Two complete sets of all special tools required for maintenance shall be provided, complete with a suitable tool box. Special tools are those that only the manufacturer provides, for special purposes (to access compartments, or operate, adjust, or maintain special parts).

PART 2 PRODUCTS

2.1 STANDARD PRODUCT

Material and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

2.2 NAMEPLATES

2.2.1 General

Each major component of this specification shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a nameplate securely attached to the equipment. Nameplates shall be made of noncorrosive metal. Equipment containing liquid dielectrics shall have the type of dielectric on the nameplate. Sectionalizer switch nameplates shall have a schematic with all switch positions shown and labeled. As a minimum, nameplates shall be provided for transformers, circuit breakers, meters, switches, and switchgear.

2.3 CORROSION PROTECTION

2.3.1 Aluminum Materials

Aluminum shall not be used.

2.3.2 Ferrous Metal Materials

2.3.2.1 Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 153/A 153M and ASTM A 123/A 123M.

2.3.2.2 Equipment

Equipment and component items, including but not limited to transformer stations and ferrous metal luminaries not hot-dip galvanized or porcelain enamel finished, shall be provided with corrosion-resistant finishes which shall withstand 480 hours of exposure to the salt spray test specified in ASTM B 117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1/16 inch from the test mark. The scribed test mark and test evaluation shall be in accordance with ASTM D 1654 with a rating of not less than 7 in accordance with TABLE 1, (procedure A). Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc rich paint conforming to the manufacturer's standard.

2.3.3 [Enter Appropriate Subpart Title Here]

2.4 CABLES

Cables shall be single conductor type unless otherwise indicated.

2.4.1 NOT USED

2.4.2 Low-Voltage Cables

Cables shall be rated 600 volts and shall conform to the requirements of NFPA 70, and must be UL listed for the application or meet the applicable section of either ICEA or NEMA standards.

2.4.2.1 Conductor Material

Underground cables shall be annealed copper complying with ASTM B 3 and ASTM B 8 .

2.4.2.2 Insulation

Insulation must be in accordance with NFPA 70, and must be UL listed for the application or meet the applicable sections of either ICEA, or NEMA standards.

2.4.2.3 Jackets

Multiconductor cables shall have an overall PVC outer jacket.

2.4.2.4 Direct Buried

Single and multi-conductor cables shall of a type identified for direct burial. Service entrance cables shall conform to UL 854 for Type USE

service entrance cable.

2.4.2.5 In Duct

Cables shall be single-conductor cable, in accordance with NFPA 70. Cables in factory-installed, coilable-plastic-duct assemblies shall conform to NEMA TC 5 or NEMA TC 7.

2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS

2.5.1 NOT USED

2.5.2 NOT USED

2.5.3 Low-Voltage Cable Splices

Low-voltage cable splices and terminations shall be rated at not less than 600 Volts. Splices in conductors No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A. Splices in conductors No. 8 AWG and larger shall be made with noninsulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A and UL 486B. Splices shall then be covered with an insulation and jacket material equivalent to the conductor insulation and jacket. Splices below grade or in wet locations shall be sealed type conforming to ANSI C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

2.6 CONDUIT AND DUCTS

Ducts shall be single type or round-bore type, with wall thickness and fittings suitable for the application. Duct lines shall be concrete-encased, thin-wall type. Duct lines shall be nonencased direct-burial, thick-wall type. Low-voltage lines or Communication lines run elsewhere may be direct-burial, thick-wall type. Where concrete encasement is not required, low-voltage circuits may utilize factory-installed cable in coilable plastic duct.

2.6.1 Metallic Conduit

Intermediate metal conduit shall comply with UL 1242. Rigid galvanized steel conduit shall comply with UL 6 and ANSI C80.1. Metallic conduit fittings and outlets shall comply with UL 514A and NEMA FB 1.

2.6.2 Nonmetallic Ducts

2.6.2.1 NOT USED

2.6.2.2 Concrete Encased Ducts

UL 651 Schedule 40 or NEMA TC 6 Type EB.

2.6.2.3 Direct Burial

UL 651 Schedule 40 and Schedule 80 as indicated, or NEMA TC 6 Type DB.

2.6.3 Conduit Sealing Compound

Compounds for sealing ducts and conduit shall have a putty-like consistency workable with the hands at temperatures as low as 35 degrees F, shall neither slump at a temperature of 300 degrees F, nor harden materially when exposed to the air. Compounds shall adhere to clean surfaces of fiber or plastic ducts; metallic conduits or conduit coatings; concrete, masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeably changing characteristics, or removing any of the ingredients. Compounds shall have no injurious effect upon the hands of workmen or upon materials.

2.7 MANHOLES, HANDHOLES, AND PULLBOXES

Manholes, handholes, and pullboxes shall be as indicated. Strength of manholes, handholes, and pullboxes and their frames and covers shall conform to the requirements of IEEE C2. Precast-concrete manholes shall have the required strength established by ASTM C 478, ASTM C 478M. Frames and covers shall be made of gray cast iron and a machine-finished seat shall be provided to ensure a matching joint between frame and cover. Cast iron shall comply with ASTM A 48, Class 30B, minimum. Handholes for low voltage cables installed in parking lots, sidewalks, and turfed areas shall be fabricated from an aggregate consisting of sand and with continuous woven glass strands having an overall compressive strength of at least 10,000 psi and a flexural strength of at least5,000psi. Pullbox and handhole covers in sidewalks, and turfed areas shall be of the same material as the box. Concrete pullboxes shall consist of precast reinforced concrete boxes, extensions, bases, and covers.

2.8 NOT USED

2.9 NOT USED

2.10 PROTECTIVE DEVICES

2.10.1 Circuit Breakers, Low-Voltage

2.10.1.1 NOT USED

2.10.1.2 Molded-Case Circuit Breakers

NEMA AB 1 and UL 489.

2.10.2 NOT USED

2.10.3 Fuses, Low-Voltage, Including Current-Limiting

Low-voltage fuses shall conform to NEMA FU 1. Time delay and nontime delay options shall be as specified. Equipment provided under this contract shall be provided with a complete set of properly rated fuses when the equipment manufacturer utilizes fuses in the manufacture of the equipment, or if current-limiting fuses are required to be installed to limit the ampere-interrupting capacity of circuit breakers or equipment to less than the maximum available fault current at the location of the equipment to be installed. Fuses shall have a voltage rating of not less than the phase-to-phase circuit voltage, and shall have the time-current characteristics required for effective power system coordination.

2.10.3.1 Cartridge Fuses

Cartridge fuses, current-limiting type, Class RK1 or RK5 or RK9 or or T

or CC shall have tested interrupting capacity not less than 200,000 amperes. Fuse holders shall be the type that will reject Class H fuses.

a. Class CC fuses shall conform to UL 198C.

b. Class R fuses shall conform to UL 198E.

c. Class T fuses shall conform to UL 198H.

2.11 NOT USED

2.12 GROUNDING AND BONDING

2.12.1 Driven Ground Rods

Ground rods shall be copper-clad steel conforming to UL 467 not less than 3/4 inch in diameter by 10 feet in length. Sectional type rods may be used.

2.12.2 Grounding Conductors

Grounding conductors shall be bare, except where installed in conduit with associated phase conductors. Insulated conductors shall be of the same material as phase conductors and green color-coded, except that conductors shall be rated no more than 600 volts. Bare conductors shall be ASTM B 8 soft-drawn unless otherwise indicated. Aluminum is not acceptable.

2.13 CONCRETE AND REINFORCEMENT

Concrete work shall have minimum 3000 psi compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Concrete reinforcing shall be as specified in Section 03200 CONCRETE REINFORCEMENT.

2.14 NOT USED

2.15 NOT USED

2.16 LIQUID DIELECTRICS

Liquid dielectrics for transformers, capacitors, reclosers, and other liquid-filled electrical equipment shall be non-polychlorinated biphenyl (PCB) mineral-oil or less-flammable liquid as specified. Nonflammable fluids shall not be used. Tetrachloroethylene (perchloroethylene) and 1, 2, 4 trichlorobenzene fluids shall not be used. Liquid dielectrics in retrofitted equipment shall be certified by the manufacturer as having less than 2 parts per million (ppm) PCB content. In lieu of the manufacturer's certification, the Contractor may submit a test sample of the dielectric in accordance with ASTM D 923 and have tests performed per ASTM D 4059 at a testing facility approved by the Contracting Officer. Equipment with test results indicating PCB level exceeding 2 ppm shall be replaced.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Equipment and devices shall be installed and energized in accordance with the manufacturer's published instructions. Except as covered herein, excavation, trenching, and backfilling shall conform to the requirements of

Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Concrete work shall have minimum 3000 psi compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.1.1 Conformance to Codes

The installation shall comply with the requirements and recommendations of NFPA 70 and IEEE C2 as applicable.

3.1.2 Verification of Dimensions

The Contractor shall become familiar with details of the work, shall verify dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

3.1.3 Disposal of Liquid Dielectrics

PCB-contaminated dielectrics must be marked as PCB and transported to and incinerated by an approved EPA waste disposal facility. The Contractor shall furnish certification of proper disposal. Contaminated dielectrics shall not be diluted to lower the contamination level.

3.2 CABLE INSTALLATION

The Contractor shall obtain from the manufacturer an installation manual or set of instructions which addresses such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, etc. The Contractor shall then perform pulling calculations and prepare a pulling plan which shall be submitted along with the manufacturers instructions in accordance with SUBMITTALS.

3.2.1 Cable Installation Plan and Procedure

Cable shall be installed strictly in accordance with the cable manufacturer's recommendations. Each circuit shall be identified by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each manhole, handhole, junction box, and each terminal. Each tag shall contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

3.2.1.1 Cable Inspection

The cable reel shall be inspected for correct storage positions, signs of physical damage, and broken end seals. If end seal is broken, moisture shall be removed from cable in accordance with the cable manufacturer's recommendations.

3.2.1.2 Duct Cleaning

Duct shall be cleaned with an assembly that consists of a flexible mandrel (manufacturers standard product in lengths recommended for the specific size and type of duct) that is 1/4 inch less than inside diameter of duct, 2 wire brushes, and a rag. The cleaning assembly shall be pulled through conduit a minimum of 2 times or until less than a volume of 8 cubic inches of debris is expelled from the duct.

3.2.1.3 Duct Lubrication

The cable lubricant shall be compatible with the cable jacket for cable that is being installed. Application of lubricant shall be in accordance with lubricant manufacturer's recommendations.

3.2.1.4 Cable Installation

The Contractor shall provide a cable feeding truck and a cable pulling winch as required. The Contractor shall provide a pulling grip or pulling eye in accordance with cable manufacturer's recommendations. The pulling grip or pulling eye apparatus shall be attached to polypropylene or manilla rope followed by lubricant front end packs and then by power cables. A dynamometer shall be used to monitor pulling tension. Pulling tension shall not exceed cable manufacturer's recommendations. The Contractor shall not allow cables to cross over while cables are being fed into duct. For cable installation in cold weather, cables shall be kept at 50 degrees F temperature for at least 24 hours before installation.

3.2.1.5 Cable Installation Plan

The Contractor shall submit a cable installation plan for all cable pulls in accordance with the detail drawings portion of paragraph SUBMITTALS. Cable installation plan shall include:

a. Site layout drawing with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.

b. List of cable installation equipment.

c. Lubricant manufacturer's application instructions.

d. Procedure for resealing cable ends to prevent moisture from entering cable.

e. Cable pulling tension calculations of all cable pulls.

f. Cable percentage conduit fill.

g. Cable sidewall thrust pressure.

h. Cable minimum bend radius and minimum diameter of pulling wheels used.

i. Cable jam ratio.

j. Maximum allowable pulling tension on each different type and size of conductor.

k. Maximum allowable pulling tension on pulling device.

3.2.2 Duct Line

Cables shall be installed in duct lines as indicated on the drawings . Cable splices in low-voltage cables shall be made in handholes or pull boxes only, except as otherwise noted. Neutral and grounding conductors shall be installed in the same duct with their associated phase conductors.

3.2.3 Direct-Burial

Low-voltage cables shall be buried directly in the earth as indicated. Minimum cover from the top of a cable to finished grade shall be 30 inches.

3.2.3.1 Trenching

Trenches for direct-burial cables shall be excavated to depths required to provide the minimum necessary cable cover. Bottoms of trenches shall be smooth and free of stones and sharp objects. Where bottoms of trenches comprise materials other than sand, a 3 inch layer of sand shall be laid first and compacted to approximate densities of surrounding firm soil.

3.2.3.2 Cable Burial

Cables shall be unreeled along the sides of or in trenches and carefully placed on sand or earth bottoms. Pulling cables into direct-burial trenches from a fixed reel position will not be permitted, except as required to pull cables through conduits under paving or railroad tracks. Where cables cross, a separation of at least 3 inches shall be provided, unless each cable circuit is protected by a nonmetallic conduit sleeve at the crossing. Where single-conductor cable is installed, all 3 phases and the neutral shall be installed in the same sleeve. Bend radius of any cable shall be not less than 8 times the diameter of the cable. In no case shall cables be left under longitudinal tension. The first 6 inch layer of backfill shall be of sand. Machine compaction shall not be used within 6 inches of the cable.

3.2.3.3 Other Requirements

Where direct-burial cables cross under roads or other paving exceeding5 feet in width, such cables shall be installed in concrete-encased ducts. Where direct-burial cables cross under railroad tracks, such cables shall be installed in reinforced concrete-encased ducts. Ducts shall extend at least 1 foot beyond each edge of any paving and at least 5 feet beyond each side of any railroad tracks. Cables may be pulled into duct from a fixed reel where suitable rollers are provided in the trench. Where direct burial cable transitions to duct-enclosed cable, direct-burial cables shall be centered in duct entrances, and a waterproof nonhardening mastic compound shall be used to facilitate such centering. If paving or railroad tracks are in place where cables are to be installed, coated rigid steel conduits driven under the paving or railroad tracks may be used in lieu of concrete-encased ducts. Damage to conduit coatings shall be prevented by providing ferrous pipe jackets or by predrilling. Where cuts are made in any paving, the paving and subbase shall be restored to their original condition.

3.2.3.4 Low-Voltage Cable Splices

Cable joints or splices in direct-burial cables are not permitted in runs of 1000 feet or less, nor at intervals of less than 1000 feet in longer runs, except as required for taps. Locations of cable joints or splices in shorter intervals, where required to avoid obstructions or damage to cables, shall be approved. Cable joints or splices in direct burial installations shall be installed in above-ground junction boxes or in cast metal splice boxes suitable for direct burial use. Cable joints or splices in duct banks shall be made only in manholes, handholes, or pullboxes.

3.2.3.5 Cable Markers

Markers shall be located near the ends of cable runs, at each cable joint

or splice, at approximately every 500 feet along cable runs, and at changes in direction of cable runs. In addition to markers, a 5 mil, brightly colored plastic tape not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers, or other approved dig-in warning indication, shall be placed approximately 12 inches below finished grade levels of trenches.

3.3 CABLE JOINTS

Medium-voltage cable joints shall be made by qualified cable splicers only. Qualifications of cable splicers shall be submitted in accordance with paragraph SUBMITTALS. Shields shall be applied as required to continue the shielding system through each entire cable joint. Shields may be integrally molded parts of preformed joints. Shields shall be grounded at each joint or in accordance with manufacturer's recommended practice. Cable joints shall provide insulation and jacket equivalent to that of the associated cable. Armored cable joints shall be enclosed in compound-filled, cast-iron or alloy, splice boxes equipped with stuffing boxes and armor clamps of a suitable type and size for the cable being installed.

3.4 NOT USED

3.5 DUCT LINES

3.5.1 Requirements

Numbers and sizes of ducts shall be as indicated. Duct lines shall be laid with a minimum slope of 4 inches per 100 feet. Depending on the contour of the finished grade, the high-point may be at a terminal, a manhole, a handhole, or between manholes or handholes. Short-radius manufactured 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 18 inches for ducts of less than 3 inch diameter, and 36 inches for ducts 3 inches or greater in diameter. Otherwise, long sweep bends having a minimum radius of 25 feet shall be used for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends, but the maximum curve used shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells whenever duct lines terminate in manholes or handholes.

3.5.2 Treatment

Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

3.5.3 Concrete Encasement

Ducts requiring concrete encasements shall comply with NFPA 70, except that electrical duct bank configurations for ducts 6 inches in diameter shall be determined by calculation and as shown on the drawings. The separation

between adjacent electric power and communication ducts shall conform to IEEE C2. Duct line encasements shall be monolithic construction. Where a connection is made to a previously poured encasement, the new encasement shall be well bonded or doweled to the existing encasement. The Contractor shall submit proposed bonding method for approval in accordance with the detail drawing portion of paragraph SUBMITTALS. At any point, except railroad and airfield crossings, tops of concrete encasements shall be not less than the cover requirements listed in NFPA 70. At railroad and airfield crossings, duct lines shall be encased with concrete and reinforced as indicated to withstand specified surface loadings. Tops of concrete encasements shall be not less than 5 feet below tops of rails or airfield paving unless otherwise indicated. Where ducts are jacked under existing pavement, rigid steel conduit will be installed because of its strength. To protect the corrosion-resistant conduit coating, predrilling or installing conduit inside a larger iron pipe sleeve (jack-and-sleeve) is required. For crossings of existing railroads and airfield pavements greater than 50 feet in length, the predrilling method or the jack-and-sleeve method will be used. Separators or spacing blocks shall be made of steel, concrete, plastic, or a combination of these materials placed not farther apart than 4 feet on centers. Ducts shall be securely anchored to prevent movement during the placement of concrete and joints shall be staggered at least 6 inches vertically.

3.5.4 Nonencased Direct-Burial

Top of duct lines shall be not less than 30 inches below finished grade and shall be installed with a minimum of 3 inches of earth around each duct, except that between adjacent electric power and communication ducts, 12 inches of earth is required. Bottoms of trenches shall be graded toward manholes or handholes and shall be smooth and free of stones, soft spots, and sharp objects. Where bottoms of trenches comprise materials other than sand, a 3 inch layer of sand shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts. Joints in adjacent tiers of duct shall be vertically staggered at least 6 inches. The first 6 inch layer of backfill cover shall be sand compacted as previously specified. The rest of the excavation shall be backfilled and compacted in3 to 6 inch layers. Duct banks may be held in alignment with earth. However, high-tiered banks shall use a wooden frame or equivalent form to hold ducts in alignment prior to backfilling.

3.5.5 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved.

3.5.5.1 NOT USED

3.5.5.2 Plastic Duct

Duct joints shall be made by brushing a plastic solvent cement on insides of plastic coupling fittings and on outsides of duct ends. Each duct and fitting shall then be slipped together with a quick 1/4-turn twist to set the joint tightly.

3.5.6 Duct Line Markers

Duct line markers shall be provided at the ends of long duct line stubouts or for other ducts whose locations are indeterminate because of duct

curvature or terminations at completely below-grade structures. In addition to markers, a 5 mil brightly colored plastic tape, not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion-resistant 1 mil metallic foil core to permit easy location of the duct line, shall be placed approximately 12 inches below finished grade levels of such lines.

3.6 HANDHOLES, AND PULLBOXES

3.6.1 General

Handholes & pullboxes shall be constructed approximately where existing are located or to replace existing requirement. The exact location of each manhole shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. The location of each handhold or pullbox shall be approved by the Contracting Officer before construction is started. Handhole or pullboxes shall be the type noted on the drawings and shall be constructed in accordance with the applicable details as indicated. Top, walls, and bottom shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. The Contractor may at his option utilize monolithically constructed precast-concrete manholes having the required strength and inside dimensions as required by the drawings or specifications. In paved areas, frames and covers for manhole and handhole entrances in vehicular traffic areas shall be flush with the finished surface of the paving. In unpaved areas, the top of handhole or pullbox covers shall be approximately 1/2 inch above the finished grade. Where existing grades that are higher than finished grades are encountered, concrete assemblies designed for the purpose shall be installed to elevate temporarily the manhole cover to existing grade level. All duct lines entering hamdholrd or pullboxes must be installed on compact soil or otherwise supported when entering to prevent shear stress on the duct at the point of entrance to the handhole or pullbox. PVC duct lines entering precast manholes through a PVC endbell shall be solvent welded to the endbell. A cast metal grille-type sump frame and cover shall be installed over the manhole sump. A cable-pulling iron shall be installed in the wall opposite each duct line entrance.

3.6.2 NOT USED

3.6.3 NOT USED

3.6.4 Handholes

Handholes shall be located were requiired. Handholes shall be of the type required by the city of Arvadia and shall be constructed in accordance with the city of Arvida.

3.6.5 Pullboxes

Pullbox tops shall be flush with sidewalks or curbs or placed 1/2 inchabove surrounding grades when remote from curbed roadways or sidewalks. Covers shall be marked "Low-Voltage" and provided with 2 lifting eyes and 2 hold-down bolts. Each box shall have a suitable opening for a ground rod. Conduit, cable, ground rod entrances, and unused openings shall be sealed with mortar.

3.6.6 Ground Rods

A ground rod shall be installed at the manholes, handholes and pullboxes. Ground rods shall be driven into the earth before the manhole floor is poured so that approximately 4 inches of the ground rod will extend above the manhole floor. When precast concrete manholes are used, the top of the ground rod may be below the manhole floor and a No. 1/0 AWG ground conductor brought into the manhole through a watertight sleeve in the manhole wall.

3.7 PAD-MOUNTED EQUIPMENT INSTALLATION

Pad-mounted equipment, shall be installed on concrete pads in accordance with the manufacturer's published, standard installation drawings and procedures, except that they shall be modified to meet the requirements of this document. Units shall be installed so that they do not damage equipment or scratch painted or coated surfaces. After installation, surfaces shall be inspected and scratches touched up with a paint or coating provided by the manufacturer especially for this purpose.

3.7.1 Concrete Pads

3.7.1.1 Construction

Concrete pads for pad-mounted electrical equipment shall be poured-in-place. Pads shall be constructed to replace existing pads that are to be removed, except that exact pad dimensions and mounting details are equipment specific and are the responsibility of the Contractor. Tops of concrete pads shall be level and shall project 4 inches above finished paving or grade and sloped to drain. Edges of concrete pads shall have 3/4 inch chamfer. Conduits for primary, secondary, and grounding conductors shall be set in place prior to placement of concrete pads. Where grounding electrode conductors are installed through concrete pads, PVC conduit sleeves shall be installed through the concrete to provide physical protection. To facilitate cable installation and termination, the concrete pad shall be provided with a rectangular hole below the primary and secondary compartments, sized in accordance with the manufacturer's recommended dimensions. Upon completion of equipment installation the rectangular hole shall be filled with masonry grout.

3.7.1.2 Concrete and Reinforcement

Concrete work shall have minimum 3000 psi compressive strength and comform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Concrete pad reinforcement shall be in accordance with Section 03200 CONCRETE REINFORCEMENT.

3.7.1.3 Sealing

When the installation is complete, the Contractor shall seal all conduit and other entries into the equipment enclosure with an approved sealing compound. Seals shall be of sufficient strength and durability to protect all energized live parts of the equipment from rodents, insects, or other foreign matter.

3.7.2 Padlocks

Padlocks shall be provided for pad-mounted equipment and for each fence gate. Padlocks shall be keyed alike as directed by the Contracting Officer.

3.8 NOT USED

3.9 CONNECTIONS TO BUILDINGS

Power shall be extended from various buildings as indicated on the drawings to signs and parking lot lighting. Notes on the drawings will indicate as to which business will require new power to connect up signs and parking lot lighting. An example of this is sheet C-9 disconnect restaurant sign (Taco Express) and reconnect after exterior construction is completed. After installation of cables, conduits shall be sealed with caulking compound to prevent entrance of moisture or gases into buildings.

3.10 GROUNDING

A grounding shall consist of replacing ground rods on lighting poles or replacing equipment grounding as required by the NEC. Equipment frames of metal-enclosed equipment, and other noncurrent-carrying metal parts, such as cable shields, cable sheaths and armor, and metallic conduit shall be grounded. Metallic frames and covers of handholes and pull boxes shall be grounded by use of a braided, copper ground strap with equivalent ampacity of No. 6 AWG.

3.10.1 Grounding Electrodes

Grounding electrodes shall be installed as as required by the city of Arvadia and as follows:

a. Driven rod electrodes - Unless otherwise indicated, ground rods shall be driven into the earth until the tops of the rods are approximately 1 foot below finished grade.

3.10.2 Grounding and Bonding Connections

Connections above grade shall be made by the fusion-welding process or with bolted solderless connectors, in compliance with UL 467, and those below grade shall be made by a fusion-welding process. Where grounding conductors are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be used.

3.10.3 Grounding and Bonding Conductors

Grounding and bonding conductors include conductors used to bond transformer enclosures and equipment frames to the grounding electrode system. Grounding and bonding conductors shall be sized as shown, and located to provide maximum physical protection. Bends greater than 45 degrees in ground conductors are not permitted. Routing of ground conductors through concrete shall be avoided. When concrete penetration is necessary, nonmetallic conduit shall be cast flush with the points of concrete entrance and exit so as to provide an opening for the ground conductor, and the opening shall be sealed with a suitable compound after installation.

3.10.4 NOT USED

3.10.5 Handhole, or Concrete Pullbox Grounding

Ground rods installed in handholes or concrete pullboxes shall be connected to cable racks, cable-pulling irons, the cable shielding, metallic sheath, and armor at each cable joint or splice by means of a No.

4 AWG braided tinned copper wire. Connections to metallic cable sheaths shall be by means of tinned terminals soldered to ground wires and to cable sheaths. Care shall be taken in soldering not to damage metallic cable sheaths or shields. Ground rods shall be protected with a double wrapping of pressure-sensitive plastic tape for a distance of 2 inches above and 6 inches below concrete penetrations. Grounding electrode conductors shall be neatly and firmly attached to manhole or handhole walls and the amount of exposed bare wire shall be held to a minimum.

3.11 FIELD TESTING

3.11.1 General

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 30 days prior to conducting tests. The Contractor shall furnish all materials, labor, and equipment necessary to conduct field tests. The Contractor shall perform all tests and inspections recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of all tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. Field test reports shall be signed and dated by the Contractor.

3.11.2 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.11.3 Ground-Resistance Tests

The resistance of each grounding electrode shall be measured using the fall-of-potential method defined in IEEE Std 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

a. Single rod electrode - 25 ohms.

3.11.4 Ground-Mat Connection Inspection

All below-grade ground-mat connections will be visually inspected by the Contracting Officer before backfilling. The Contractor shall notify the Contracting Officer 48 hours before the site is ready for inspection.

3.11.5 NOT USED

3.11.6 Low-Voltage Cable Test

Low-voltage cable, complete with splices, shall be tested for insulation resistance after the cables are installed, in their final configuration, ready for connection to the equipment, and prior to energization. The test voltage shall be 500 volts dc, applied for one minute between each

conductor and ground and between all possible combinations conductors in the same trench, duct, or cable, with all other conductors in the same trench, duct, or conduit. The minimum value of insulation shall be:

R in megohms = (rated voltage in kV + 1) x 1000/(length of cable in feet

Each cable failing this test shall be repaired or replaced. The repaired cable shall be retested until failures have been eliminated.

3.11.7 NOT USED

3.11.8 NOT USED

3.11.9 Circuit Breaker Tests

The following field tests shall be performed on circuit breakers. Pass-fail criteria shall be in accordance with the circuit breaker manufacturer's specifications.

a. Insulation resistance test phase-to-phase.

b. Insulation resistance test phase-to-ground.

c. Closed breaker contact resistance test.

d. Power factor test.

e. High-potential test.

f. Manual operation of the breaker.

3.11.10 NOT USED

3.11.11 NOT USED

3.11.12 Pre-Energization Services

Calibration, testing, adjustment, and placing into service of the installation shall be accomplished by a manufacturer's product field service engineer or independent testing company with a minimum of 2 years of current product experience. The following services shall be performed on the equipment listed below. These services shall be performed subsequent to testing but prior to the initial energization. The equipment shall be inspected to ensure that installation is in compliance with the recommendations of the manufacturer and as shown on the detail drawings. Terminations of conductors at major equipment shall be inspected to ensure the adequacy of connections. Bare and insulated conductors between such terminations shall be inspected to detect possible damage during installation. If factory tests were not performed on completed assemblies, tests shall be performed after the installation of completed assemblies. Components shall be inspected for damage caused during installation or shipment to ensure packaging materials have been removed. Components capable of being both manually and electrically operated shall be operated manually prior to the first electrical operation.

3.11.13 Operating Tests

After the installation is completed, and at such times as the Contracting Officer may direct, the Contractor shall conduct operating tests for

approval. The equipment shall be demonstrated to operate in accordance with the requirements herein. An operating test report shall be submitted in accordance with paragraph SUBMITTALS.

3.12 MANUFACTURER'S FIELD SERVICE

3.12.1 Onsite Training

The Contractor shall conduct a training course for the operating staff as designated by the Contracting Officer. The training period shall consist of a total of 4 hours of normal working time and shall start after the system is functionally completed but prior to final acceptance tests. The course instruction shall cover pertinent points involved in operating, starting, stopping, and servicing the equipment, as well as all major elements of the operation and maintenance manuals. Additionally, the course instructions shall demonstrate all routine maintenance operations. A VHS format video tape of the entire training session shall be submitted.

3.12.2 Installation Engineer

After delivery of the equipment, the Contractor shall furnish one or more field engineers, regularly employed by the equipment manufacturer to supervise the installation of the equipment, assist in the performance of the onsite tests, initial operation, and instruct personnel as to the operational and maintenance features of the equipment.

3.13 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --