AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF PAGES
W00B0012	1	2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0005	13 NOV 2000		

6. ISSUED BY CODE

LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

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

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

CODE FACILITY CODE

(√) X

9A. AMENDMENT OF SOLICITATION NO.
DACW09-00-B-0012

9B. DATED *(SEE ITEM 11)*
28 NOV 2000 (BID OPENING)

10A. MODIFICATION OF CONTRACTS/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

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

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

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

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

(√) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER *(Specify type of modification and authority)*

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

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

LOWER FLAMINGO DIVERSION CHANNEL (El Camino Road to Tropicana Detention Basin), CLARK COUNTY, NEVADA

1. Replace Section 00010, Solicitation, Offer, and Award (SF 1442) and Bidding Schedule, with Enclosure No. 1
2. Replace Section 00850, Rates of Wages, with Enclosure No. 2.
3. Replace Section 01200, General Requirements, with Enclosure No. 3.
4. Replace Section 01270, Measurement and Payment, with Enclosure No. 4.
5. Replace the Submittal Register (ER 4288) in Section 01330, Submital Procedures, with Enclosure No. 5.
6. Add Section 01702, As-Built Drawings, with Enclosure No. 6.
7. Replace Section 02316, Excavation, Trenching, and Backfilling for Utilities Systems, with Enclosure No. 7.
8. Add Section 02500, Station Markings, with Enclousre No. 8.
9 Replace Section 02741, Bituminous Paving for Roads, Streets and Open Storage Areas, with Enclosure No. 9.
10. Replace Section 02821, Fencing, Chain Link, with Enclosure No. 10

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

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

11. Replace Section 03301, Cast-In-Place Structural Concrete, with Enclosure No. 11.

12. Replace Section 05500, Miscellaneous Metals, with Enclosure No. 12

13. Replace Drawings (District File Numbers): 196/622,196/624, 196/625, 196/630, 196/631, 196/632, 196/633, 196/639, 196/645, 196/646, 196/647, 196/649, 196/658/196/659.

14. Add Drawing : Sheet 18A (196/670).

14 Encls:

1. Section 00010, Solicitation, Offer, and Award (SF 1442) and Bidding Schedule
2. Section 00850, Rates of Wages
3. Section 01200, General Requirements
4. Section 01270, Measurement and Payment
5. Submittal Register (ER 4288)
6. Section 01702, As-Built Drawings
7. Section 02316, Excavation, Trenching, and Backfilling for Utilities Systems
8. Section 02500, Station Markings
9. Section 02741, Bituminous Paving for Roads, Streets and Open Storage Areas
10. Section 02821, Fencing, Chain Link
11. Section 03301, Cast-In-Place Structural Concrete
12. Section 05500, Miscellaneous Metals
13. Drawings (District File Numbers): Rev. B: 196/622, 196/624, 196/625 196/630, 196/631, 196/632 196/633, 196/639, 196/645, 196/646, 196/647, 196/649, 196/658, 196/659.
14. Drawing: Sheet 18A (196/670)

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO. DACW09-00-B-0012	2. TYPE OF SOLICITATION ☒ SEALED BID (IFB) ☐ NEGOTIATED (RFP)	3. DATE ISSUED 8/18/00	PAGE OF PAGES 1 131

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

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO. W81EYN-0174-9713	6. PROJECT NO.

7. ISSUED BY CODE DACW09

US ARMY CORPS OF ENGINEERS, L.A. DISTRICT
CONTRACTING DIVISION
P.O. BOX 532711
LOS ANGELES, CA 90053-235

8. ADDRESS OFFER TO

SEE ITEM 7

9. FOR INFORMATION CALL:	A. NAME SANDRA OLIVER-HALL	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) (213) 452-3243

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):

LOWER FLAMINGO DIVERSION CHANNEL, (EL CAMINO ROAD TO TROPICANA DETENTION BASIN), CLARK COUNTY, NEVADA

THE ESTIMATED COST OF THIS ACQUISITION IS $10,000,000 TO $25,000,000.

THE PROJECT CONSISTS OF CONSTRUCTION OF APPROXIMATELY 2,620 METERS OF CHANNEL TO INCLUDE RECTANGUALR REINFORCED CONCRETE CHANNEL; TRAPEZOIDAL REINFORCED CONCRETE CHANNEL; REINFORCED BOX CULVERTS; CHANNEL TRANSITION STRUCTURES, 1 LATERAL CONFLUENCE, 2 INVERT ACCESS RAMPS; SIDE DRAINS; AGGREGATE BASE COURSE/ASPHALT PAVEMENT ROADS, RELOCATION OR WATER AND SEWER UTILITIES, CHAIN LINK FENCE; SAFETY RAILS AND INCIDENTALS. EXCAVATION CONSIST OF EXCAVATION, COMPACTED FILL AND DISPOSAL OF EXCESS EXCAVATED MATERIALS TO MANDATORY DISPOSAL SITES.

BIDDERS ARE ADVISED THAT THE PROJECT MAY BE DELAYED, CANCELLED OR REVISED AT ANY TIME DURING THE SOLICITAITON, SELECTION AND/OR FINAL AWARD PROCESS.

11. The Contractor shall begin performance within 10 calendar days and complete it within 360 calendar days after receiving ☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. (See SECTION 00800 .)

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

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 1:00 P.M. (hour) local time 11/28/00 (date). If this is a sealed bid solicitation, offers will 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 90 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

NSN 7540-01-155-3212

STANDARD FORM 1442 (REV. 4-85)
Prescribed by GSA USAPPC V1.00
FAR (48 CFR) 53.236-1 (d)

*DENOTES CHANGE
ENCLOSURE NO. 1 TO AMENDMENT NO. 0005

OFFER *(Must be fully completed by offeror)*

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*

15. TELEPHONE NO. *(Include area code)*

16. REMITTANCE ADDRESS *(Include only if different than Item 14)*

CAGE CODE NO.: _____ DUNS NO.: _____

CODE FACILITY CODE

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

AMOUNTS ▶ SEE SCHEDULE OF PRICES

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

19. ACKNOWLEDGMENT OF AMENDMENTS

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

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

20B. SIGNATURE

20C. OFFER DATE

AWARD *(To be completed by Government)*

21. ITEMS ACCEPTED:

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN ▶ *(4 Copies unless otherwise specified)*

ITEM

25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C 2304(c) ( ) ☐ 41 U.S.C 253(c) ( )

26. ADMINISTERED BY CODE

27. PAYMENT WILL BE MADE BY

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT *Contractor is required to sign this document and return _____ copies to issuing office.)* Contractor agrees to furnish and deliver all items or perform all work requirements 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

SECTION 00010 Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001		1.00	Lump Sum	$_____	$_____
	TRAFFIC CONTROL				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002		1.00	Lump Sum	$_____	$_____
	DIVERSION AND CONTROL OF WATER				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003		1.00	Lump Sum	$_____	$_____
	CLEAR SITE AND REMOVE OBSTRUCTIONS				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0004		175,500.00	Cubic Meter	$_____	$_____
	EXCAVATION				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0005		53,800.00	Cubic Meter	$_____	$_____
	COMPACTED FILL, CHANNEL				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0006		157,700.00	Cubic Meter	$_____	$_____
	COMPACTED FILL, DISPOSAL SITE				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0007		7,470.00	Cubic Meter	$_____	$_____
	CONCRETE,INVERT SLAB				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0008		6,062.00	Cubic Meter	$_____	$_____
	CONCRETE, WALLS				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0009		103.00	Cubic Meter	$_____	$_____
	CONCRETE, SIDE SLOPE				

,

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0010	CONCRETE CUT-OFF WALL	47.00	Cubic Meter	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0011	CONCRETE OVERFLOWS	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0012	TRAPEZOIDAL TO RECTANGULAR TRANSITION STA 11+20.000 TO STA. 11+80.000	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0013	BOX CULVERT @ DECATUR BLVD. STA. 14+57 TO STA. 16+38.00	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0014	INVERT ACCESS RAMP STA. 18+14.686 TO STA. 18+77.224	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0015	BOX CULVERT @ RUSSELL ROAD STA. 20+15.000 TO STA. 20+82.000	1.00	Lump Sum	$_____	

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0016	BOX CULVERT @ LINDELL ROAD STA. 25+90.000 TO STA. 26+35.000	1.00	Lump Sum	$_____	

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0017	INVERT ACCESS RAMP STA. 31+30.000 TO STA. 31+82.773	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0018	CONFLUENCE / INVERT TRANSITION STA. 32+36.570 TO STA. 32+94.570	1.00	Lump Sum	$_____	$_____

,

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0019		1.00	Lump Sum	$_____	$_____
	BOX CULVERT @ JONES BLVD. STA. 33+63.526 TO STA. 34+13.632				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0020		1.00	Lump Sum	$_____	$_____
	JONES LATERAL STA. 5+88.425 TO STA. 7+32.923				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0021		1,022.00	MetricTon	$_____	$_____
	REINFORCING STEEL				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0022		3,310.00	MetricTon	$_____	$_____
	AGGREGATE BASE COURSE				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0023		1,987.00	Metric Ton	$_____	$_____
	ASPHALTIC CONCRETE PAVEMENT				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0024		780.00	Metric Ton	$_____	$_____
	STONE PROTECTION				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0025		120.00	Cubic Meter	$_____	$_____
	GROUTING STONE PROTECTION				

THIS ITEM IS DELETED

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0026		1.00	Lump Sum	$_____	$_____
	WEEPHOLE SYSTEM				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0027		1.00	Lump Sum	$_____	$_____
	INVERT ACCESS LADDERS				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0028		1.00	Lump Sum	$_____	$_____
	SIDE DRAIN, STA. 13+41.000 LT.				

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0029	SIDE DRAIN, STA. 15+00.000 RT.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0030	SIDE DRAIN, STA. 20+31.000 RT.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0031	SIDE DRAIN, STA. 20+56.076 LT.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0032	SIDE DRAIN, STA. 25+87.000 RT.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0033	SIDE DRAIN, STA. 29+97.000 RT.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0034	SIDE DRAIN, STA. 31+17.500 RT.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0035	ROAD DETOURS @ DECATUR BLVD.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0036	UTILITIES @ DECATUR BLVD.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0037	ROAD DETOURS @ LINDELL B LVD.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0038	UTILITIES @ LINDELL BLVD.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0039	ROAD DETOURS @ JONES BLVD.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0040	UTILITIES @ JONES BLVD.	1.00	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0041	UTILITIES @ RUSSELL ROAD	1	Lump Sum	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0042	CHAIN LINK FENCE	3,177.00	Meter	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0043	PIPE SAFETY RAILING	4,480.00	Meter	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0044	DOUBLE SWING GATES	6.0	Each Per Month	$_____	$_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0045	SOIL STABILIZER	126,400.00	Square Meter	$_____	$_____

ITEM NO	**SUPPLIES/SERVICES**	**QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
***0046**	**STATION MARKINGS**	**1**	**Lump Sum**	**$_____**	**$_____**

ITEM NO	**SUPPLIES/SERVICES**	**QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
***0047**	**AS-BUILT DRAWINGS**	**1**	**Lump Sum**	**$_____**	**$_____**

TOTAL ESTIMATED AMOUNT **$_____**

* DENOTES CHANGE

SECTION 00850

RATES OF WAGES

Enclosure No. 2 to Amendment No. 0005

General Decision Number NV000005

Superseded General Decision No. NV990005

State: Nevada

Construction Type:
HEAVY
HIGHWAY

County(ies):

CARSON CITY	EUREKA	NYE
CHURCHILL	HUMBOLDT	PERSHING
CLARK	LANDER	STOREY
DOUGLAS	LINCOLN	WASHOE
ELKO	LYON	WHITE PINE
ESMERALDA	MINERAL	

HEAVY AND HIGHWAY CONSTRUCTION PROJECTS (Except construction projects at the NEVADA TEST SITE and TONOPAH TEST RANGE) (and Excluding Water Well Drilling)

Modification Number	Publication Date
0	02/11/2000
1	09/29/2000
2	11/13/2000
3	11/17/2000

COUNTY(ies):

CARSON CITY	EUREKA	NYE
CHURCHILL	HUMBOLDT	PERSHING
CLARK	LANDER	STOREY
DOUGLAS	LINCOLN	WASHOE
ELKO	LYON	WHITE PINE
ESMERALDA	MINERAL	

CARP0034L 07/01/1998

CARSON CITY, CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE AND WHITE PINE COUNTIES

	Rates	Fringes
DIVER STANDBY	27.65	12.425
DIVER WET	38.90	12.425
DIVER TENDER	27.65	12.425
PILE DRIVERS: (Bridge, Warf & Dock Builders)	25.65	12.425

---

* CARP0971E 10/01/2000

CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, AND WHITE PINE.

	Rates	Fringes
CARPENTERS	24.70	5.40

CARP1780A 07/01/1999

CLARK, ESMERALDA, LINCOLN AND NYE COUNTIES

	Rates	Fringes
CARPENTERS:		
30 Mile radius around Las Vegas (Measured from the intersection of Maryland Parkway and Charleston Blvd.)	27.18	7.65
30 to 50 Mile radius around Las Vegas (same as above)	28.68	7.65
Over 50 mile Mile radius around Las Vegas (same as above)	30.43	7.65
Laughlin Area	29.18	7.65

ELEC0357F 06/01/1999

CLARK, LINCOLN, AND NYE (South of the Mt. Diablo Base Line)

COUNTIES

ELECTRICIANS	26.95	9.21+3%
CABLE SPLICERS	27.28	9.21+3%

ELEC0357G 07/01/1997

	Rates	Fringes
CLARK, LINCOLN, AND NYE COUNTIES		
LINE CONSTRUCTION WORKERS:		
Area bound by a 30 mile radius from the intersection of Main Street and Fremont Street in Las Vegas (Free Area)		
Groundman	17.98	5.95+3%
Line Equipment Operators	21.86	5.95+3%
Lineman	24.45	5.95+3%
Area between a 30 mile radius and 60 mile radius from Main and Fremont Streets		
Groundman	18.98	5.95+3%
Line Equipment Operators	22.86	5.95+3%
Lineman	25.45	5.95+3%
Area Over 60 mile radius from Main and Fremont Streets		
Groundman	20.98	5.95+3%
Line Equipment Operators	24.86	5.95+3%
Lineman	27.45	5.95+3%

ELEC0401F 12/01/1998

	Rates	Fringes
CHURCHILL, DOUGLAS, ELKO, ESMERALDA, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, AND WHITE PINE COUNTYS.		
ELECTRICIANS:		
ELECTRICAINS	24.00	5.95+3%
CABLE SPLICER	26.40	5.95+3%

ELEC0401G 02/01/1993

	Rates	Fringes
CHURCHILL, DOUGLAS, ELKO, ESMERALDA, EUREKA, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, AND WHITE PINES COUNTYS.		
LINE CONSTRUCTION:		
Lineman	21.74	5.34+3-3/4%
Cable Splicer	23.91	5.34+3-3/4%

Equipment Operator	19.57	5.34+3-3/4%
Groundman	14.13	5.34+3-3/4%

ENGI0012H 08/01/1999

HYDRAULIC SUCTION AND CLAMSHELL DREDGES

	Rates	Fringes
Leverman	34.20	8.00
Deck Captain	31.30	8.00
Dozer	30.73	8.00
Watch Engineer, Welder and Deckmate	30.62	8.00
Winchman (Stern Winch) (on dredge)	30.07	8.00
Deckhand (can operate anchor scow under direction of mate), Bargeman	29.53	8.00
Barge mate	30.14	8.00

* ENGI0012J 07/01/2000

CLARK, ESMERALDA LINCOLN AND NYE COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATORS:		
Group 1	28.54	8.30
Group 2	29.49	8.30
Group 3	29.78	8.30
Group 4	30.67	8.30
Group 5	31.77	8.30
Group 6	30.89	8.30
Group 7	31.99	8.30
Group 8	31.00	8.30
Group 9	32.10	8.30
Group 10	31.12	8.30
Group 11	32.22	8.30
Group 12	31.29	8.30
Group 13	31.39	8.30
Group 14	31.42	8.30
Group 15	31.50	8.30
Group 16	31.62	8.30
Group 17	31.79	8.30
Group 18	31.89	8.30
Group 19	32.00	8.30
Group 20	32.12	8.30
Group 21	32.29	8.30
Group 22	32.39	8.30
Group 23	32.50	8.30
Group 24	32.62	8.30

CRANES, PILEDRIVING & HOISTING EQUIPMENT

Group 1	29.29	8.30
Group 2	30.24	8.30

Group 3	30.53	8.30
Group 4	30.67	8.30
Group 5	30.89	8.30
Group 6	31.00	8.30
Group 7	31.12	8.30
Group 8	31.29	8.30
Group 9	31.46	8.30
Group 10	32.46	8.30
Group 11	33.96	8.30
Group 12	34.46	8.30
Group 13	35.46	8.30

TUNNEL GROUP:

Group 1	30.74	8.30
Group 2	31.03	8.30
Group 3	31.17	8.30
Group 4	31.39	8.30
Group 5	31.50	8.30
Group 6	31.62	8.30
Group 7	31.79	8.30

From the City Hall of Las Vegas
20 Miles to 40 Miles - add $1.50 per hour to wage rates
40 Miles to 60 Miles - add $2.50 per hour to wage rates
Over 60 Miles - add $3.00 per hour to wage rates

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1: Bargeman, brakeman, compressor operator (when more than five (5) 900 CFM or larger units, additional operator required), ditch witch, with eat or similar type equipment, elevator operator - inside, engineer oiler, generator operator, generator, pump or compressor plant operator, pump operator, signalman, switchman

GROUP 2: Asphalt - rubber plant operator, concrete mixer operator - skip type, conveyor operator, fireman, hydrostatic pump operator, oiler crusher (asphalt or concrete plant), skiploader (when wheel type up to 3/4 yd. without attachment), soils field technician, tar pot fireman, temporary heating plant operator, trenching machine operator

GROUP 3: Asphalt - rubber blend operator, equipment greaser (rack), ford ferguson (with dragtype attachments), helicopter radioman (ground), power concrete curing machine operator, power concrete saw operator, power - driven jumbo form setter operator, stationary pipe wrapping and cleaning machine operator

GROUP 4: Asphalt plant fireman, backhoe operator (mini-max or similar type), boring machine operator, boxman or mixerman (asphalt or concrete), chip spreading machine operator, concrete pump operator (small portable), drilling machine operator, small auger types (Texoma super economatic or similar types - Hughes 100 or 200 or similar types - drilling depth of 30' maximum), equipment greaser (grease truck), guard rail post driver operator, highline cableway signalman, hydra-hammer-aero

stomper, power sweeper operator, roller operator (compacting), screed operator (asphalt or concrete), trenching machine operator (up to 6 ft.)

GROUP 5: Equipment Greaser (Grease Truck)

GROUP 6: Asphalt plant engineer, batch plant operator, bit sharpener, concrete joint machine operator (canal and similar type), concrete planer operator, deck engine operator, derrickman (oilfield type), drilling machine operator, bucket or auger types (Caldwell 100 bucket or similar types - Watson 1000 auger or similar types - Texoma 330, 500 or 600 auger or similar types - drilling depth of 45' maximum), drilling machine operator, hydrographic seeder machine operator (straw, pump or seed), Jackson track maintainer, or similar type, Kalamazoo switch tamper, or similar type, machine tool operator, Maginnis internal full slab vibrator, mechanical berm, curb or gutter (concrete or asphalt), mechanical finisher operator (concrete, Clary-Johnson-Bidwell or similar type), pavement breaker operator (truck mounted), road oil mixing machine operator, roller operator (asphalt or finish), rubber - tired earth moving equipment (single engine, up to and including 25 yds. struck), self-propelled tar pipelining machine operator, skiploader operator (crawler and wheel type, over 3/4 yd. and up to and including 1-1/2 yds.), slip form pump operator (power driven hydraulic lifting device for concrete forms), tractor operator - bulldozer, tamper-scraper (single engine, up to 100 h.p. flywheel and similar types, up to and including D-5 and similar types), tugger hoist operator

GROUP 7: Asphalt or concrete spreading operator (tamping or finishing), asphalt paving machine operator (Barber Greene or similar type - 1 screedman required), Asphalt -rubber distributor operator, backhoe operator (up to and including 3/4 yd.), small Ford, Case or similar, cast-in-place pipe laying machine operator, combination mixer and compressor operator (gunite work), compactor operator (self-propelled), concrete mixer operator (paving), crushing plant operator, drill doctor, drilling machine operator, bucket or auger types (Caldwell 150 bucket or similar types - Watson 1500, 2000 2500 auger or similar types - Texoma 700, 800 auger or similar types - drilling depth of 60' maximum), elevating grader operator, grade checker, gradall operator, grouting machine operator, heavy-duty repairman, kalamazoo ballast regulator or similar type, Kolman belt loader and similar type, Le Tourneau blob compactor or similar type, loader operator (Athey, Euclid, Sierra and similar types), pneumatic concrete placing machine operator (Hackley-Presswell or similar type), pumpcrete operator, rotary drill operator (excluding caisson type), rubber-tired earth-moving equipment operator (single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. up to and including 50 cu. yds. struck), rubber-tired earth-moving equipment operator (multiple engine up to and including 25 yds. struck), rubber-tired scraper operator (self-loading paddle wheel type - John Deere, 1040 and similar single unit), self- propelled curb and gutter machine operator,

skipload operator (crawler and wheel type over 1-1/2 yds. up to and including 6-1/2 yds.), surface heaters and planer operator, tractor compressor drill combination operator, tractor operator (any type larger than D-5 - 100 flywheel h.p. and over, or similar - bulldozer, tamper, scraper and push tractor single engine), tractor operator (boom attachments), traveling pipe wrapping, cleaning and bending machine operator, trenching machine operator (over 6 ft. depth capacity, oiler required)

GROUP 8: Heavy duty repairman

GROUP 9: Drilling machine operator, bucket or auger types (Caldwell 200 B bucket or similar types - Watson 3000 or 5000 auger or similar types - Texoma 900 auger or similar types - drilling depth of 105' maximum), dual drum mixer, monorail locomotive operator (diesel, gas or electric), motor patrol - blade operator (single engine), multiple engine tractor operator (Euclid and similar type - except Quad 9 cat.), rubber-tired earth-moving equipment operator (single engine, over 50 yds. struck), rubber-tired earth-moving equipment operator (multiple engine, Euclid, Caterpillar and similar over 25 yds. and up to 50 yds.), tower crane repair person, tractor loader operator (crawler and wheel type over 6-1/2 yds.), Woods mixer operator (and similar pugmill equipment)

GROUP 10: Dynamic compactor LDC350 (or similar types

GROUP 11: Auto grader operator, automatic slip form operator, drilling machine operator, bucket or auger types (Caldwell, auger 20 CA or similar types - Watson auger 6000 or similar types - drilling depth of 175' maximum), hoe ram or similar with compressor, mass excavator operator, mechanical finishing machine operator, mobile form traveler operator, motor patrol operator (multi-engine), pipe mobile machine operator, rubber-tired earth-moving equipment operator (multiple engine, Euclid, Caterpillar and similar type, over 50 cu. yds. struck), rubber-tired self-loading scraper operator (paddle-wheel-auger type self-loading - two (2) or more units)

GROUP 12: Rubber-tired earth-moving equipment operator operating equipment with push-pull system (single engine, up to and including 25 yds. struck)

GROUP 13: Canal liner operator, canal trimmer operator, remote-control earth-moving equipment operator, wheel excavator operator

GROUP 14: Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 yds. struck), rubber-tired earth-moving equipment operator, operating equipment with push-pull system (multiple engine - up to and including 25 yds. struck)

GROUP 15: Rubber-tired earth-moving equipment operator,

operating equipment with push-pull system (single engine, over 50 yds. struck), rubber-tired earth-moving equipment operator, operating equipment with push-pull system (multiple engine, Euclid, Caterpillar and similar, over 25 yds. and up to 50 yds. struck)

GROUP 16: Rubber-tired earth-moving equipment operator, operating equipment with push-pull system (multiple engine, Euclid, Caterpillar and similar, over 50 cu. yds. struck), tandem tractor operator (operating crawler type tractors in tandem - Quad 9 and similar type)

GROUP 17: Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - single engine, up to and including 25 yds. struck)

GROUP 18: Rotex concrete belt operator (or similar types), rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, including compaction units - single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 cu. yds. struck), rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - multiple engine, up to and including 25 yds. struck),

GROUP 19: Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - single engine, over 50 yds. struck), rubber-tired earth moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - multiple engine, euclid, caterpillar and similar over 25 yds. and up to 50 yds. struck)

GROUP 20: Rubber-tired earth-moving equipment operator, operating in tandem (scrapers, belly dumps and similar types in any combination, excluding compaction units - multiple engine, Euclid, Caterpillar and similar type, over 50 cu. yds. struck)

GROUP 21: Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (single engine, up to and including 25 yds. struck)

GROUP 22: Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (single engine, Caterpillar, Euclid, Athey Wagon and similar types with any and all attachments over 25 yds. and up to and including 50 yds. struck), rubber-tired earth-moving equipment operator, operating with the tandem push-pull system (multiple engine, up to and including 25 yds. struck)

GROUP 23: Rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system

(single engine, over 50 yds. struck), rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (multiple engine, Euclid, Caterpillar and similar, over 25 yds. and up to 50 yds. struck)

GROUP 24: Concrete pump operator - truck mounted (oiler required when boom over 105' or 36 meters), rubber-tired earth-moving equipment operator, operating equipment with the tandem push-pull system (multiple engine, Euclid, Caterpillar and similar type, over 50 cu. yds. struck)

CRANES, PILEDRIVING AND HOISTING EQUIPMENT CLASSIFICATIONS:

GROUP 1: Engineer oiler; Fork lift operator (under 5 tons capacity)

GROUP 2: Truck crane oiler

GROUP 3: A-frame or winch truck operator; Ross carrier operator (jobsite)

GROUP 4: Bridge-type unloader and turntable operator; Helicopter hoist operator

GROUP 5: Stinger crane (Austin-Western or similar type); Tugger hoist operator (1 drum)

GROUP 6: Bridge crane operator; Cretor crane operator; Fork lift operator (over 5 tons); Hoist operator (Chicago boom and similar type); Lift mobile operator; Lift slab machine operator (Vagtborg and similar types); Material hoist operator; Shovel, backhoe, dragline, clamshell operator (over 3/4 yd. and up to 5 cu. yds. mrc); Tugger hoist operator

GROUP 7: Pedestal crane operator; Shovel, backhoe, dragline, clamshell operator (over 5 cu. yds. mrc); Tower crane repair; Tugger hoist operator (3 drum)

GROUP 8: Crane operator (up to and including 25 ton capacity); Crawler transporter operator; Derrick barge operator (up to and including 25 ton capacity); Hoist operator, stiff legs, Guyderrick or similar type (up to and including 25 ton capacity); Shovel, backhoe, dragline, clamshell operator (over 7 cu. yds. mrc)

GROUP 9: Crane operator (over 25 tons and up to and including 50 tons mrc); Derrick barge operator (over 25 tons up to and including 50 tons mrc); Highline cableway operator; Hoist operator, stiff legs, Guy derrick or similar type (over 25 tons up to and including 50 tons mrc); K-crane operator; Polar crane operator; Tower crane operator

GROUP 10: Crane operator (over 50 tons and up to and including 100 tons mrc); Derrick barge operator (over 50 tons up to and including 100 tons mrc); Hoist operator, stiff legs, Guy

derrick or similar type (over 50 tons up to and including 100 tons mrc)

GROUP 11: Crane operator (over 100 tons and up to and including 200 tons mrc); Derrick barge operator (over 100 tons up to and including 200 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 100 tons up to and including 200 tons mrc); Mobile tower crane operator (over 100 tons up to and including 200 tons mrc)

GROUP 12: Crane operator (over 200 tons up to and including 300 tons mrc); Derrick barge operator (over 200 tons up to and including 300 tons mrc); Hoist operator, stiff legs, Guy derrick or similar type (over 200 tons, up to and including 300 tons mrc); Mobile tower crane operator (over 200 tons, up to and including 300 tons mrc)

GROUP 13: Crane operator (over 300 tons); Derrick barge operator (over 300 tons); Helicopter pilot; Hoist operator, stiff legs, Guy derrick or similar type (over 300 tons); Mobile tower crane operator (over 300 tons)

TUNNEL CLASSIFICATIONS

GROUP 1: Skiploader (wheel type up to 3/4 yd. without attachment)

GROUP 2: Power-driven jumbo form setter operator

GROUP 3: Dinkey locomotive or motorman (up to and including 10 tons)

GROUP 4: Bit sharpener; Equipment greaser (grease truck); Slip form pump operator (power-driven hydraulic lifting device for concrete forms); Tugger hoist operator (1 drum); Tunnel locomotive operator (over 10 and up to and including 30 tons); Welder - general

GROUP 5: Backhoe operator (up to and including 3/4 yd.); Small Ford, Case or similar; Drill doctor; Grouting machine operator; Heading shield operator; Heavy-duty repairperson; Loader operator (Athey, Euclid, Sierra and similar types); Mucking machine operator (1/4 yd., rubber-tired, rail or track type); Pneumatic concrete placing machine operator (Hackley-Presswell or similar type); Pneumatic heading shield (tunnel); Pumpcrete gun operator; Tractor compressor drill combination operator; Tugger hoist operator (2 drum); Tunnel locomotive operator (over 30 tons)

GROUP 6: Heavy duty repairman - welder combination

GROUP 7: Tunnel mole boring machine operator

---

* ENGI9993D 07/01/1998

CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, WHITE PINE AND CARSON CITY

POWER EQUIPMENT OPERATORS
(Except Piledriving and Steel Erection)

	Rates	Fringes
AREA 1:		
Group 1A	23.78	7.86
Group 2	24.31	7.86
Group 3	24.58	7.86
Group 4	25.32	7.86
Group 5	25.62	7.86
Group 6	25.79	7.86
Group 7	26.04	7.86
Group 8	26.63	7.86
Group 9	26.95	7.86
Group 10	27.30	7.86
Group 10A	27.49	7.86
Group 11	27.73	7.86
Group 11A	29.37	7.86
Group 11B	30.18	7.86

PILEDRIVING

AREA 1:		
Group 1	33.07	7.86
Group 2	27.13	7.86
Group 3	25.21	7.86
Group 4	31.55	7.86
Group 5	26.92	7.86
Group 6	25.01	7.86
Group 7	30.10	7.86
Group 8	26.70	7.86
GROUP 9	24.78	7.86
Group 10	28.59	7.86
Group 11	27.48	7.86
Group 12	26.37	7.86
Group 13	25.41	7.86
Group 14	24.45	7.86

STEEL ERECTION

AREA 1:		
Group 1	33.62	8.56
Group 2	27.45	8.56
Group 3	25.49	8.56
Group 4	32.11	8.56
Group 5	27.20	8.56
Group 6	25.28	8.56
Group 7	30.87	8.56
Group 8	26.98	8.56
Group 9	26.65	8.56

Group 10	25.06	8.56
Group 11	29.14	8.56
Group 12	28.04	8.56

POWER EQUIPMENT OPERATOR CLASSIFICATIONS
CHURCHILL. DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, WHITE PINE, CARSON CITY

(EXCLUDING PILEDRIVING AND STEEL ERECTION)

GROUP 1A: Oiler; Partsman (heavy duty repair shop partsroom when needed).

GROUP 2: Compressor; Material Loader and/or Conveyor (handling building materials); Pump Operator

GROUP 3: Bobcat or similar loader (1/4 cu. yd. or less); Concrete Curing Machines (streets); Conveyor belt operator; Forklift (under 20 ft.); Engineer Generating plant (500 K.W.); Mixer box operator (concrete plant); Motorman; Rotomist Operator; Screedman (except asphaltic or concrete paving); Oiler (truck crane)
GROUP 4: Concrete mixer, skip type; Dinky; Forklift (20' and over) or Lumber stacker; Ross Carrier; Skip Loader (under 1 cu. yd); Tie Spacer.

GROUP 5: Concrete mixer (over 1 cu. yd); concrete pumps or pumpcrete guns; Elevator and material Hoist (1 drum); Groundman for Asphalt Milling and similar.

GROUP 6: Auger type drilling equipment up to and including 30 ft. depth digging capacity m.r.c.; Boom Truck or Dual Purpose "A" Frame Truck; B.L.H. Lima road pactor or similar; Chip box spreader (flaherty type or similar); Concrete batch plant (wet or dry); Concrete saws (highways, streets, airports, canals); Locomotive (over 30 tons); Lubrication and service engineer (mobile & grease rack); Maginnis international full slab vibrator (airports, highways, canals, warehouses); Mechanical finishers (concrete)(clary, Johnson, Bidwell Bridge Deck or similar types); Mechanical Burn, Curb and/or Curb and Gutter Machine (concrete or asphalt); Pavement breaker, truck mounted, with compressor combination; Pavement breaker or tamper (with or without compressor (combination); Power Jumbo (setting slip-forms, etc. in tunnels); Roller (except asphalt); Self-propelled tape machine; Self-propelled compactor (single engine); Self-propelled power sweeper; slip form pump (power-driven by hydraulic, electric, air, gas, etc. lifting device for concrete forms); Small Rubber-tired Tractors; Snooper Crane, Paxton-Mitchell or similar; Stationary Pipe Wrapping, Cleaning and Bending Machine Operator

GROUP 7: Auger type drilling equipment over 30 ft. depth digging capacity m.r.c.; Compressor (over 2); Concrete conveyor or concrete pump, truck equipment mounted (boom length to apply); Concrete conveyor, building site; Drilling and boring Machinery, vertical and horizontal (not to apply to waterliners, wagon drills or jackhammers); Crusher Plant Engineer; Generators;

Kolman Loader; Material Hoist (2 or more drums); Mechanical finishers or spreader machine (asphalt, Barber-Greene and similar); (Screedman required); Mine or shaft hoist; Pipe bending machines (pipelines only); Pipe cleaning machines (tractor propelled and supported); Pipe wrapping machines (tractor propelled and supported); Portable crushing and screening plants; Post driller and/or driver; Pumps (over 2); Roller operator (asphalt); Screedman (except asphaltic or concrete paving; Screedman (Barber-Green and similar)(Aspaltic or concrete paving); Self-propelled boom-type lifting device (center amount) (10 ton capacity or less); Slusher; Soil tester (certified); Soils and material tester; Surface heater and planer; Trenching machine (maxiumum digging capacity 3 feet depth); Truck type loader; Welding machines (gasoline or diesel.

GROUP 8: Asphalt milling Machine; Asphalt plant engineer; Cast-in-place pipe laying machine; Combination slusher and motor op.; Concrete batch plant (multiple units); Dozer Operator; Drill doctor; Elevating grader; Gradesetter, Grade checker; Grooving and grinding machine (highway); Heavy duty repairman and/or welder; Ken-seal; Loader (up to and including 2 1/2 cu. yds.); Mechanical trench shield; Mixermobile; Push cats; Road oil mixing machine (wood-mixer and other similar pugmill equipment); Rubber-tired earth-moving equipment (up to and including 35 cu. yds."struck" M.R.C. Euclid, T-pulls, DW's 10, 20, 21, and similar); Self-propelled compactor with dozer; Hyster 450 or cat 825 or similar; Sheepfoot; Small tractor (with boom); Soil stabilizer (P & H or equal); Timber skidder (rubber-tired and/or similar equipment); Tractor-drawn scraper; Tractor; Tractor-mounted compressor drill combination; Trenching machine (over 3 feet depth); Tri-batch paver; Tunnel badger or tunnel boring machine; Tunnel mole boring machine; Vermeer T-600b rock cutter.

GROUP 9: Chicago boom; Combination backhoe and loader (up to and including 3/8 yard); Combination mixer and compressor (gunite); Lull hi-lift (20 feet or over); Mucking machine; Sub-grader (gurries or other types); Tractor (with boom) (D6 or larger); Track-laying-type earthmoving machine (single engine with tandem scrapers).

GROUP 10: Boom-type backfillng machine; Bridge crane; Carylift or similar; Chemical grouting machine; Derricks (two (2) Group 10 operators required when swing engine remote from hoist); Derrick barges (except excavation work); Euclid loader and similar types; Heavy-Duty rotary drill rigs; Lift-slab (vagtborg and similar types); Loader (over 2 1/2 cu yds. up to and including 4 cu. yds); Locomotive (over 100 tons) (single or multiple units); Multiple-Engine earth-moving machines (euclid, dozers, etc.); Pre-stress wire-wrapping machine; Rubber-tried scraper, self-loading; Single-engine scraper (over 35 cu. yds); Shuttle car (reclaim station); Train loading station; Trenching machine multi-engine with sloping attachment (jefco or similar); Vacuum cooling plant; Whirley crane (up to and including 25 tons).

GROUP 10A: Backhoe (up to and including 1 cu. yd hydraulic);

Backhoe (up to and including 1 cu. yd. cable); CMI dual lane auto -grader SP30 or similar; Cranes (not over twenty five (25) tons (hammerhead and gantry); Finish Blade; Gradalls (up to and including 1 cu. yd); Motor patrol; Power shovels, Clamshells, Draglines, Cranes (up to and including 1 cu. yd.); Rubber-tried scraper, self-loading (twin-engine); Self-propelled boom-type lifting device (center mount) (over 10 tons up to and including 25 tons).

GROUP 11: Automatic asphalt or concrete slip-form paver; Automatic railroad car dumper; Canal trimmer; Cary lift, campbell or similar; Cranes (over 25 tons); Euclid loader when controled from the pullcat; Highline cableway operator; Loader (over 4 cu yds. up to and including 12 cu. yds.); Multi-Engine earthmoving equipment (up to and including 75 cu. yds. "struck M.R.C); Multi ple Engine Scrapers (when used to push pull); Power shovels, Clam-shells, Draglines, Backhoes, Gradealls (over 1 cu. yd. and up to and including 7 cu. yds. M.R.C.); Self-propelled Boom type lifting device (over 25 tons M.R.C.); Self-propelled Compactor (with multipleproplusion power units); Single-engine rubber-tried earthmoving machine (with tandem scraper); Slip-form paver (concrete or asphalt)(one (1) Operator and two (2) screedman); Tandem cats and scrapers; Tower crane mobile (including rail-mounted); Truck-mounted hydraulic crane when remote-control equipped (over 10 tons up to and including 25 tons); Universal Liebher and tower cranes (and similar types)(in the erection, dismantling and moving of equipment there shall be an additional operating engineer at group 8 rates); Wheel excavator (up to and including 750 cu. yds. per hour); Whirley cranes (over 25 tons).

GROUP 11A: Band wagons (in conjuction with wheel excavators); Operator of helicopter (when used in construction work); Loaders (over 12 cu. yds.); Multi-engine earthmoving equimpent (over 75 cu. yds. "struck" M.R.C.); Power shovels, Clamshells, Draglines, Backhoes and Gradalls (over 7 cu. yds. M.R.C.); Remote-controlled Earthmoving equipment; Wheel excavator (over 750 cu. yds. per hour)(two (2) Group 11A operators required).

GROUP 11B: Holland loader or similar or loader (over 18 cu. yds)

PILEDRIVING CLASSIFICATIONS

GROUP 1: Derrick barge pedestal mounted over 100 tons; Clam-shells over 7 cu. yds.; Self propelled boom type lifting device over 100 tons; Truck crane or crawler, land or barge mounted over 100 tons;

GROUP 2: Truck crane oiler.

GROUP 3: Oiler

GROUP 4: Derrick barge pedestal mounted 45 tons up to and including 100 tons; Clamshells up to and including 7 cu. yds; Self propelled boom type lifting device over 45 tons; Truck crane or crawler, land or barge mounted over 45 tons up to and including 100 tons.

GROUP 5: Truck crane oiler.

GROUP 6: Oiler

GROUP 7: Derrick barge pedestal mounted under 45 tons; self propelled boom type lifting device 45 tons and under; Skid/Scow Piledriver, any tonnage; (any assistance required shall be by an employee covered by this agreement); Truck crane or crawler, land or barge mounted 45 tons and under.

GROUP 8: Truck Crane oiler

GROUP 9: Oiler

GROUP 10: Forklift, 10 tons and over

GROUP 11: No current classification.
GROUP 12: Deck engineer

GROUP 13: No current classification

GROUP 14: Deckhand, Fireman

STEEL ERECTORS AND FABRICATORS

GROUP 1: Cranes, over 100 tons; Derrick over 100 tons, Self-propelled boom type lifting devices over 100 tons.

GROUP 2: Truck crane oiler.

GROUP 3: Oiler

GROUP 4: Cranes, over 45 tons up to and including 100 tons; Derrick 100 tons and under, Self-propelled boom type lifting device, over 45 tons; Tower Crane.

GROUP 5: Truck crane oiler.

GROUP 6: Oiler

GROUP 7: Cranes, 45 tons and under; Self propelled boom type lifting device, 45 tons and under

GROUP 8: Truck crane oiler
GROUP 9: Hydraulic
GROUP 10: Oiler

GROUP 11: Chicago boom; Forklift, 10 tons and over; Heavy Duty Repairman/Welder.

GROUP 12: Boom cat

AREA DEFININITIONS AND PAY RATES

AREA 1:
ALL AREA FALLING WITHIN 50 ROAD MILES OF EITHER THE CARSON CITY COURTHOUSE OR THE WASHOE COUNTY COURHOUSE SHALL BE CONSIDERED FREE AREA.

AREA 2:
ALL WORK FALLING BETWEEN 50 AND 150 ROAD MILES OF THE WASHOE COUNTY COURTHOUSE SHALL BE COMPUTED AT AN ADDITIONAL $1.50 PER HOUR ABOVE THE BASE RATE.

AREA 3:
ALL WORK FALLING BETWEEN 150 AND 300 ROAD MILES OF THE WASHOE COUNTY COURTHOUSE SHALL BE COMPUTED AT AN ADDITIONAL $2.00 PER HOUR ABOVE THE BASE RATE.

AREA 4:
ANY WORK PERFORMED IN EXCESS OF 300 ROAD MILES OF THE WASHOE COURTHOUSE SHALL BE COMPUTED AT AN ADDITIONAL $3.00 PER HOUR ABOVE THE BASE RATE.

ENGI9993K 07/01/1997

CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, WHITE PINE AND CARSON CITY

HYDRAULIC SUCTION & CLAMSHELL & DIPPER DREDGE

	Rates	Fringes
GROUP 1:		
Area 1	31.04	11.89
Area 2	33.04	11.89
GROUP 2:		
Area 1	26.08	11.89
Area 2	28.08	11.89
GROUP 3:		
Area 1	24.96	11.89
Area 2	26.96	11.89

DREDGING CLASSIFICATIONS

GROUP 1:
Day Mate (Captain); Leverman/Operator

GROUP 2:
Booster Pump Operator, Deck Engineer, Deck Mate, Dredge Dozer; Dredge Tender; Heavy Duty Repairman; Watch Engineer; Winchman

GROUP 3:
Bargeman; Deckhand; Fireman; Leveehand; Oiler

AREA DEFININITIONS

AREA 1:
ALL AREA FALLING WITHIN 50 ROAD MILES OF EITHER THE CARSON CITY COURTHOUSE OR THE WASHOE COUNTY COURHOUSE SHALL BE CONSIDERED FREE AREA.

AREA 2:
ALL WORK FALLING BETWEEN 50 AND 150 ROAD MILES OF THE WASHOE COUNTY COURTHOUSE.

AREA 3:
ALL WORK FALLING BETWEEN 150 AND 300 ROAD MILES OF THE WASHOE COUNTY COURTHOUSE.

AREA 4:
ANY WORK PERFORMED IN EXCESS OF 300 ROAD MILES OF THE WASHOE COURTHOUSE.

IRON0027J 07/01/2000

	Rates	Fringes
ELKO, EUREKA, AND WHITE PINE COUNTIES		
IRON WORKERS:		
Fence Erectors: Machinery Movers Ornamental: Reinforcing. Rigger Structural	22.17	7.21

IRON0155B 07/01/2000

	Rates	Fringes
CHURCHILL, CLARK, DOUGLAS, ESMERALDA, HUMBOLDT, LANDER, LINCOLN, LYON, MINERAL, NYE, PERSHING, STOREY, WASHOE, AND WHITE PINE COUNTIES		
IRONWORKERS:		
STRUCTURAL, ORNAMENTAL AND REINFORCING	24.83	14.375
FENCE ERECTORS (Excluding Clark County)	23.94	14.375

LABO0169F 10/01/1999

	Rates	Fringes
CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, WHITE PINE, CARSON CITY		
Group 1	18.35	4.62
Group 1-A	15.48	4.62
Group 2	18.45	4.62
Group 3	18.60	4.62
Group 4	18.85	4.62
Group 5	19.15	4.62

Group 6	19.15	4.62
Group 7	18.85	4.62
Group 8	18.50	4.62
Group 9	13.19	4.62

From the Washoe County Courthouse
50 Miles to 150 Miles - add $1.50 per hour to wage rates
150 Miles to 300 Miles - $2.00 per hour to wage rates
Over 300 Miles - add $3.00 per hour to wage rates

CLASSIFICATIONS

GROUP 1: All cleanup work of debris, grounds and building including windows and tile; dump or spotter (other than asphalt); general laborers; limber, brushloader and piler

GROUP 1-A: Flagmen

GROUP 2: Choker setter or rigger (clearing work only); Pittsburgh chipper and similar type brush shredders; concrete worker (wet or dry) all concrete work not listed in Group 3; crusher or grizzle tender; Guinea chaser (stake); panel forms (wood or metal) handling, cleaning and stripping of; loading and unloading of all rods and materials for reinforcing concrete; railroad track (builders); sloper; semi-skilled wrecker (salvaging of building materials other than those listed in Group 3).

GROUP 3: Asphalt workers (ironers, shoveler, cutting machine); buggymobile; chainsaw, faller, logloader and bucker; compactor (all types); concrete mixer, under 1/2 yd.; concrete pan work (breadpan type) (handling, cleaning, stripping); concrete saw, chipping, grinding, sanding, vibrator; cribbing, shoring, lagging, trench jacking, hand-guided lagging hammer; curbing or divider machine; curb setter (precast or cut); Ditching machine (hand-guided); driller's tender, chuck tender; form raiser, slip forms; grouting of concrete walls, windows and door jams; headerboard; jackhammer, pavement breaker, air spade; mastic worker (wet or dry); pipe wrapper, kettle, pot, and workers applying asphalt, Creosote and similar type materials; all power tools (air, gas or electric); post driver; riprap stonepaver and rock slinger, including placing of sack concrete, wet or dry; roto tiller; rigging and signaling in connection with laborers work, sandblaster, pot men; vibrascreed; skilled wrecker (removing and salvaging of sash windows, doors, plumbing and electrical; fixtures)

GROUP 4: Burning and welding in connection with laborers' work; joy drill model TWM-2A, gardener denver model DN 143 and similar type drills; track drillers, diamond core drillers, wagon drillers, mechanical drillers on multiple units; high scalers; concrete pump; heavy duty vibrator with stinger 5" diameter or over; pipelayer, caulker and bander; pipelayer - waterline, sewerline, gasline, conduit; asphalt rakers

GROUP 5: Blaster and powder, all work of loading, placing and blasting of all powder and explosive of any type, regardless of method used used for such loading and placing; asbestos removal; lead abatement, hazardous waste and material removal.

GROUP 6: Nozzlemen, Rodman

GROUP 7: Gunmen, Materialmen

GROUP 8: Reboundmen

GROUP 9: Landscaper

---

* LAB00872D 07/01/2000

	Rates	Fringes
CLARK, ESMERALDA, AND LINCOLN COUNTIES; NYE COUNTY (South half, including Highway #6)		
LABORERS:		
Group 1	21.58	7.46
Group 2	21.74	7.46
Group 3	21.84	7.46
Group 4	21.93	7.46
Group 5	22.02	7.46
Group 6	21.84	7.46
Group 7	18.53	7.46

30 - 50 Miles From City Hall, Las Vegas $1.50 above the base rate.

50 - 70 Miles From City Hall, Las Vegas $2.50 above the base rate.

Over 70 Miles From City Hall, Las Vegas $3.00 above the base rate.

Laughlin Area $2.25 above the base rate.

LABORER CLASSIFICATIONS

Group 1: Dry Packing of concrete and filling of form-bolt holes; fine grader, highway and street paving, airport runaways and similar type heavy construction; gas and oil pipeline laborer; guinea chaser; laborer, general; construction or demolition laborer; packing rod steel and pans; laborers; temporary water lines (portable type); landscape gardener and nursery worker (must have knowledge of plant materials and how to plant them lay out plant arrangements to-follow the landscape plan); tarman and mortarman; kettleman; potman and worker applying asphalt lay-kold creosote, lime and similar type materials ("applying" means applying, dipping, brushing or handling of such materials for pipe wrapping and waterproofing); underground laborer,

including caisson bellowers; window cleaner; scafford erector - (excludes tenders); fence erector - chain link; mortarless, barrier wall and/or retaining walls; mechanical stabilized earth wall; landscape decorative rock installer - ponds, water fall etc.; material handler - (incidental to trade).

Group 2: Asphalt raker, ironer, spreader, Luteman, buggymobile man; cement dumper (on 1 yard or larger mixers and handling bulk cement); cesspool digger and installer; chucktender (except tunnels); concrete core cutter; concrete curer, impervious membrane and oiler of all materials; concrete saw, excluding tractor type, cutting, scoring old or new concrete; gas and oil pipeline wrapper, pot tender and form; making and caulking of all non metallic pipe joints; operators and tenders of pneumatic and electric tools, vibrating machines, hand-propelled trenching machines, impact wrench, multiplate and similar mechanical tools not separately classified herein; operator of cement grinding machine; riprap stonepaver; roto-scraper; sandblaster (pot tender); scaler; septic tank digger and installer; tank scaler and cleaner; tree climber, faller, chain saw operator, pittsburgh chipper and similar type brush shredders

Group 3: Cutting torch operator; gas and oil pipeline wrapper; gas and oil pipeline laborer, certified; jackhammer and/or pavement breaker, laying of all non-metallic pipe, including landscape sprinklers, sewerpipe, drain pipe, and underground tile; mudcutter; concrete vibrator, all sizes; rock slinger; scaler (using Bos'n chair or safety belt or power tools); forklift (incidental to trade) a journeyman shall hold OSHA certification at time of referral.

Group 4: Cribber or shorer, lagging, sheeting, trenching bracing hand guided lagging hammer; head rock slinger; powder - blaster, all work of loading holes, placing and blasting of all powder and explosives of whatever type, regardless of method used for such loading and placing; sandblaster (nozzle operator); steel headerboard

Group 5: Driller (core, diamond or wagon); joy driller model TW-M-2a, Gardener-Denver Model DH 143 and similar type drills (in accordance with memorandum of understanding between laborers and operating engineers dated Miami, Florida, February 3, 1954); Gas and oil pipeline fusion; gas and oil pipeline wrappers, 6" pipe and over-

Group 6: Environmental specialist (asbestos abatement, lead abatement, Hazardous waste abatement, petro-chemical abate ment, radiation remediation.

Group 7: Flag and Signal Person

---

* LABO0872I 07/01/1999

	Rates	Fringes

CLARK, ESMERALDA, AND LINCOLN COUNTIES; NYE COUNTY (South half, including Highway #6)

LABORERS:

MINER AND BULLGANG

Group 1	23.07	7.48
Group 2	22.57	7.48
Group 3	22.32	7.48
Group 4	22.93	7.48
Group 5	22.57	7.48

30 - 50 Miles From City Hall, Las Vegas $1.50 above the base rate.

50 - 70 Miles From City Hall, Las Vegas $2.50 above the base rate.

Over 70 Miles From City Hall, Las Vegas $3.00 above the base rate.

Laughlin Area $2.25 above the base rate.

CLASSIFICATIONS

Group 1: Shaft, Raise, Stope Miner

Group 2: Miner - Tunnel (Hardrock)

Group 3: BullGang, Mucker, Trackman

Group 4: Miner - Welder

Group 5: Pipe Jacking, Micro-Tunneling, Tunnel Boring Machine

---

PAIN0159F 07/01/1999

CLARK, ESMERALDA, LINCOLN AND NYE COUNTIES

	Rates	Fringes
PAINTERS:		
Brush, Roller, Paperhangers, Spray, Sandblasters, Pot Tender, Nozzleman, Tapers, Marbleizing, Metal Leafing Sign Painters, Acid Staining, Graining and Buffing	24.27	5.05
Structural Steel Paint and Sandblasting, Buffing Steel	24.62	5.05
Special Coating	25.27	5.05
Steeplejack	26.02	5.05

PAIN0567E 10/01/1999

	Rates	Fringes

CARSON CITY, CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE AND WHITE PINE COUNTIES

PAINTERS:		
Brush and Roller	20.03	4.36
Spray; Paperhangers; and Sandblaster; Special Coatings Application - Brush	20.78	4.36
Structural Steel (not to include stairways, tube steel, Q-decks & trust joints worked off powered lift in enclosed building); Steeplejack Brush/ Spray over 40 feet with open space below; Special Coatings Application - Spray	21.03	4.36
Special Coatings Application - Spray Steel	21.28	4.36
Drywall Taper	21.28	4.36
Steeplejack - Taper, over 40 ft. with open space	22.18	4.36

PLAS0241G 10/01/1997

	Rates	Fringes
CHURCHILL, DOUGLAS, ELKO, ESMERALDA, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, AND WHITE PINE COUNTIES		
CEMENT MASONS		
Cement Masons	17.02	7.10
Mastic. magesite and all composition masons	17.27	7.10

PLAS0797G 07/01/1999

	Rates	Fringes
CLARK, ESMERALDA, LINCOLN AND NYE COUNTIES		
CEMENT MASONS:		
0 to 30 Miles from City Hall in Las Vegas	24.23	6.55
30 to 50 Miles from City Hall in Las Vegas	25.73	6.55
50 to 70 Miles from City Hall in Las Vegas	26.73	6.55
Over 70 Miles from City Hall in Las Vegas	27.73	6.55

PLUM0350G 08/01/1999

	Rates	Fringes
CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, WHITE PINE, CARSON CITY COUNTIES, and NYE COUNTY (North of Hwy. #6 including the City of Tonopah)		
PLUMBERS & PIPEFITTERS	22.95	9.95

PLUM0525G 06/01/1999

	Rates	Fringes
CLARK, ESMERALDA AND LINCOLN, COUNTIES; NYE COUNTY (South of Hwy. #6 including the City of Tonopah)		
PLUMBERS & PIPEFITTERS	28.85	8.82

ROOF0162D 03/01/1999

	Rates	Fringes
ROOFERS	17.78	3.17

SHEE0026C 07/01/1998

	Rates	Fringes
CHURCHILL, DOUGLAS, ELKO, EUREKA, HUMBOLDT, LANDER, LYON, MINERAL, PERSHING, STOREY, WASHOE, CARSON CITY AND NYE COUNTY (North of the First Standard Parallel Line north of the 38th Parallel)		
SHEET METAL WORKERS	23.93	7.97

SHEE0088H 07/01/2000

	Rates	Fringes
CLARK, ESMERALDA, AND LINCOLN COUNTIES; NYE COUNTY (South of the First Standard Parallel Line north of the 38th Parallel); WHITE PINE COUNTY		
SHEET METAL WORKERS	30.82	7.77

TEAM0533A 01/01/1998

	Rates	Fringes
REMAINING COUNTIES AND NYE COUNTY (North of and including highwAY #6)		
TRUCK DRIVERS		
All dump trucks (Single or multiple dump units including Semi's and Double and Transfer units:		
Under 4 yards (water level)		

4 yards and under 8 yards (water level)	16.62	7.40
3 yards & under 18 yards (water level)	16.84	7.40
3 yards & under 25 yards (water level)	17.05	7.40
25 yards & under 60 yards (water level)	17.64	7.40
60 yards & under 75 yards (water level)	19.08	7.40
75 yards & under 100 yards (water level)	19.82	7.40
100 yards & over (water level)	20.50	7.40
150 yards & under 250 yards	22.50	7.40
250 yards & under 350 yards	25.50	7.40
Over 350 yards	27.00	7.40

(Men regularly employed underground on tunnel work shall be paid forty-five ($.45) cents per hour for such work, provided that such employment underground on tunnel work continues for one (1) or more hours)

Bulk cement spreader (with or with or without Auger) Use dump truck scales.

Bootman (a bootman when employed on such equipment shall receive the rate specified for the classification of road oil trucks or bootman).

Transit Mix, Manufactures Rating:

Under 8 yards	17.05	7.40
8 yards & including 12 yards	17.16	7.40
Over 12 yards	17.38	7.40

Transit Mix with boom shall receive $.12-1/2 cents per hour above the appropriate yardage classification rate

of pay when such boom is used.

Water Trucks:		
Up to 2,500 gallons	16.84	7.40
2,500 gallons & over	17.05	7.40
Jetting truck (use appropriate water truck rate.		
DW20's and 21's and other similar cat type, Terra cobra, Le Tourneau pulls, Tournerocker, Euclid and similar type equipment when pulling Aqua/pak, Water tank trailers and fuel and/or Grease Tank trailer or other miscellaneous trailers (except as definded under dump trucks.	17.33	7.40
Heavy Duty Transport (High bed)	17.22	7.40
Heavy Duty Transport (Gooseneck Low Bed)	17.22	7.40
Tiltbed or Flatbed Pull Trailers	17.22	7.40
Bootman, combination bootman and road oiler	17.11	7.40
Flat Rack (2 or 3 axle unit)	14.94	7.40
Bus and Manhaul drivers:		
Up to 18,000 lbs. (single unit)	16.67	7.40
18,000 lbs & over (single unit)	16.78	7.40
Helicopter Pilot (when transporting men or materials)	30.66	7.40
Industrial Lift truck (use appropriate flat rack rate (mechanical tailgate)		
Lift Jitneys & Fork Lift	16.89	7.40
Winch Truck & "A" Frame Drivers:		
Under 18,000 lbs.	16.78	7.40
18,000 lbs. & over	16.89	7.40
Warehouse Spotters	16.23	7.40
Teamsters Warehouse Clerk	16.84	7.40

Tire Repairman	16.55	7.40
Truck Repairman	17.05	7.40
Pick-up Truck & Pilot Cars (Job Site)	14.74	7.40
Pick-up Truck & Pilot Car (over the road)	16.73	7.40
Truck Oil and Greaser	16.78	7.40
Fuel Truck Driver	16.78	7.40
Fuel Man & Fuel Island Man	16.78	7.40

When on grease and fuel truck, an Engineer Oil and Teamster Oil, work interchangeable servicing trucks and other equipment, The wage rate shall be identical.

AREA 1: All that area falling within fifty (50) road miles of either the Carson City or Washoe County Courthouse shall be considerer a free area.

AREA 2: All work falling between fifty (50) and (150) road miles of the Washoe County Courthouse shall be computed at and additional $1.50 per hour.

AREA 3: All work falling between one hundred and fifty (150) and three hundred (300) road miles of the Washoe County Courthouse shall be computed at additional $2.00 per hour.

AREA 4: Any work performed in excess of three hundred (300) road miles of the Washoe County Courthouse shall be computed at $3.00 per hour.

TEAM0631A 07/01/1999

	Rates	Fringes

CLARK, ESMERALDA, LINCOLN COUNTIES AND NYE COUNTY (South of and excluding Highway #6)

TRUCK DRIVERS:

GROUP 1:	21.35	7.12
GROUP 2:	21.46	7.12
GROUP 3:	21.67	7.12
GROUP 4:	21.85	7.12
GROUP 5:	22.00	7.12

GROUP 6: 22.35 7.12

30 - 50 Miles from City Hall, Las Vegas $1.00 above the base rate.
50 - 70 Miles from City Hall, Las Vegas $2.00 above the base rate.
70 - 80 Miles from City Hall, Las Vegas $3.00 above the base rate.
Over 80 Miles from City Hall, Las Vegas $3.50 above the base rate.
Laughlin and Mesquite Areas, $3.00 above the base rate.

Group 1: Dump trucks (less than 12 yards water level); trucks (legal payload capacity less than 15 tons); water and fuel trucks (under 2500 gallons); pickups; service; drivers of busses (on jobsite used for transportation of up to 25 passengers); teamster equipment (highest rate for dual craft operation); working flat rack driver.

Group 2: Dump trucks (12 yards but less than 16 yards water level); trucks (legal payload capacity between 15 and 20 tons); transit mix trucks (under 3 yds.; dumpcrete trucks (less than 6-1/2 yds. water level); gas and oil pipeline working truck drivers; including winch truck and all sizes of trucks; water and fuel truck drivers (2,500 gallon to 4,000 gallon); truck greaser; drivers of busses (on jobsite used for transportation of more than twenty-five (25) passengers); warehouse clerk.

Group 3: Dump trucks (16 yds. up to and including 22 yds. water level); driver of trucks (legal payload cap. 20 tons but less than 30 tons); dumpster trucks; drivers of transit-mix trucks (3 yds. but less than 6 yds.); dumpcrete trucks (6-1/2 yds. water level and over); fork lift driver; ross carrier driver; highway water and fuel drivers (4,000 gallons but less than 6,000 gallons); stock room clerk; tireman.

Group 4: Transit-mix trucks (6 yds. or more); dump trucks (over 22 yds. water level); trucks (legal payload capacity 30 tons and over); fuel and water trucks (6,000 gallons and over).

Group 5: Drivers of trucks and trailers in combination (seven axles or more).

Group 6: All offroad equipment; truck repairmen and drivers of road oil spreader trucks; D.W. 10 and D.W. 20 euclid-type equipment, letourneau pulls, terra cobras and similar types of equipment; also PB and similar-type trucks when performing work within Teamsters' jurisidiction, regardless of types of attachment inlcuding power unit pulling off highway belly dumps in tandem.

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)(v)).

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 01200

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES
1.2 PROJECT FACILITIES
1.2.1 Construction Signs
1.2.2 Bulletin Board
1.2.3 Sanitary Facilities

PART 2 PRODUCTS

2.1 CONSTRUCTION SIGNS
2.1.1 Materials
2.1.1.1 Lumber
2.1.1.2 Plywood
2.1.1.3 Bolts, Nuts and Nails
2.1.1.4 Paints and Oils

PART 3 EXECUTION

3.1 CONSTRUCTION OF SIGNS
3.1.1 Project and Hard Hat Signs
3.1.2 Warning Signs
3.2 PAINTING SIGNS
3.3 PROJECT ENGINEERS'S OFFICE EQUIPMENT
3.4 BULLETIN BOARD
3.5 MAINTENANCE AND DISPOSAL OF PROJECT FACILITIES
3.6 UNSATISFACTORY AND SCRAP MATERIAL
3.7 ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION
3.8 PROTECTION OF EXISTING WORK
3.9 PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS
3.9.1 General
3.9.2 Relocation or Removal
3.9.3 Utilities Not Shown
3.9.4 Coordination
3.9.5 Notices
3.9.5.1 Utilities To be Relocated or Protected
3.9.5.2 Existing Bench Marks and R/W Markers
3.9.5.3 Disposal Site
3.9.5.4 Spill Reporting
3.9.5.5 Environmental Assessment Requirement
3.9.6 Restrictions

3.9.6.1 Representatives of Other Agencies
3.9.6.2 Traffic Control Plan
3.9.6.3 Existing Roads
3.9.6.4 Access and Haul Roads
3.9.6.5 Public and Private Access Roads
3.9.6.6 Maintenance of Roads
3.9.6.7 Traffic Safety
3.9.6.8 Rock and Gravel
3.9.6.9 Cooperation with Others
3.9.6.10 Temporary Culverts
3.9.7 Working Hours
3.9.8 Construction Water
3.9.9 Lighting
3.9.10 Identification of Vehicles
3.9.11 Construction Method Observation
3.9.12 Contractor's Equipment
3.10 PUBLIC SAFETY
3.11 OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) STANDARDS
3.11.1 Accident Reporting
3.12 PERMITS
3.12.1 General
3.12.2 Air Pollution Permit (APP)
3.12.3 National Pollutant Discharge Elimination System (NPDES) Permit
3.13 NOTICE OF PARTNERSHIP
3.14 AS-BUILT DRAWINGS
3.14.1 General
3.14.2 Options
3.14.3 Submittal to Contracting Officer for review and approval
3.15 DISPOSAL SITES
3.15.1 Disposal Site
3.16 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15, 31 OCT 89)
3.17 REQUIRED INSURANCE
3.18 SPECIAL CONSTRUCTION REQUIREMENTS
3.18.1 PROJECT LIMITS
3.18.2 ORDER OF CHANNEL CONSTRUCTION
3.18.2.1 Storm Runoff
3.18.2.2 Construction sequencing of RCB channel sections and Jones confluence.
3.18.2.3 Coordination with other Contractors and Agencies

-- End of Section Table of Contents --

SECTION 01200

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

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

DEPARTMENT OF COMMERCE (DOC)

DOC PS 1	(1983) Construction and Industrial Plywood

FEDERAL SPECIFICATIONS (FS)

FS FF-B-575	(Rev C) Bolts, Hexagon and Square
FS FF-N-105	(Rev B; Am 3, Int Am 4; Notice 1) Nails, Brads, Staples and Spikes: Wire, Cut and Wrought
FS FF-N-836	(Rev D; Am 2) Nut, Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat
FS MM-L-751	(Rev H) Lumber; Softwood
FS TT-P-1510	(Rev A, Am 1) Paint, Latex, Exterior for Wood Surfaces, White and Tints
FS TT-P-001984	(Basic) Primer Coating, Latex Base, Exterior (Undercoat for Wood), White and Tints

1.2 PROJECT FACILITIES

The Contractor shall construct and/or erect the following project facilities as soon as possible and not less than 15 calendar days after notice to proceed.

1.2.1 Construction Signs

The signs shall include the following:

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

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

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

1.2.2 Bulletin Board

Bulletin board shall be erected at the Contractor's office.

1.2.3 Sanitary Facilities

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

PART 2 PRODUCTS

2.1 CONSTRUCTION SIGNS

2.1.1 Materials

2.1.1.1 Lumber

FS MM-L-751, and shall be seasoned Douglas Fir, S4S, Grade D or better except that posts, braces and spacers shall be construction Grade (WCLB).

2.1.1.2 Plywood

DOC PS 1, grade A-C, Group 1, exterior type.

2.1.1.3 Bolts, Nuts and Nails

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

2.1.1.4 Paints and Oils

Paints shall conform to FS TT-P-001984 for primer and FS TT-E-1510 for finish paint and lettering.

PART 3 EXECUTION

3.1 CONSTRUCTION OF SIGNS

3.1.1 Project and Hard Hat Signs

Constructed as detailed in Figures 1, 1A, 2, 3 and Safety Signs. Decals signs will be furnished by the Contracting Officer.

3.1.2 Warning Signs

Constructed of plywood not less than 1/2 inch thick and shall be securely bolted to the supports with the bottom of the sign face 3 feet above the ground. The sign face shall be 24 in. x 48 in., all letters shall be 4 in. in height, and the wording shall be: "WARNING: OVERHEAD TRANSMISSION LINES."

3.2 PAINTING SIGNS

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

3.3 PROJECT ENGINEERS'S OFFICE EQUIPMENT

Contractor shall provide computer software (3.5" floppy disc size) to the Contracting Officer for the type of scheduling system to be used and quantity/fill programs for tracking or estimating bid quantities during construction. Scheduling software must be capable of downloading completely to the COE Standard Data Exchange Format. The Contractor shall utilize a hand held radio system for communication between the Contractor's quality control representative and the Government's quality assurance representative. Radio equipment for the Governments use shall include a hand held radio, two batteries and one charger. The Contractor shall provide Government personnel with the following equipment for the duration of the contract: 1 Cellular telephone with voice mail, 2 nickel cadmium batteries, 1 desk top charger, 1 travel charger, and 400 minutes of air time per month or portion thereof.

3.4 BULLETIN BOARD

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

3.5 MAINTENANCE AND DISPOSAL OF PROJECT FACILITIES

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

3.6 UNSATISFACTORY AND SCRAP MATERIAL

Materials characterized as unsatisfactory soil in accordance with Section

02200 EXCAVATION and materials indicated to be removed and not indicated to be salvaged, stored or reinstalled are designated as scrap shall become the property of the Contractor and be removed from the site of work. The Contractor by signing this contract hereby acknowledges that he made due allowance for value, if any, of such scrap in the contract price.

3.7 ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION

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

3.8 PROTECTION OF EXISTING WORK

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

3.9 PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS

3.9.1 General

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

3.9.2 Relocation or Removal

Utilities to be relocated or removed not as part of this contract are designated "To be Relocated by Others" or "To be Removed by Others", respectively. Utilities shown on the plans and not so designated will be left in place and be subject to the provisions of the CONTRACT CLAUSE:

PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS. The Contractor may make arrangements with the owner for the temporary relocation and restoration of utilities not designated to be relocated, or for additional work in excess of the work needed to relocate utilities designated for relocation at no additional cost to the Government.

3.9.3 Utilities Not Shown

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

3.9.4 Coordination

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

3.9.5 Notices

3.9.5.1 Utilities To be Relocated or Protected

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

3.9.5.2 Existing Bench Marks and R/W Markers

The Contractor shall notify the Contracting Officer, in writing, 7 days in advance of the time he proposes to remove any bench mark or right-of-way marker.

3.9.5.3 Disposal Site

Excess Satisfactory excavated materials not utilized as part of the construction shall be crashed or processed to maximum particle size of 3/4 of lift thickness, hauled, placed, and compacted in the disposal site per lines and grades shown on drawing sheet 30. Unsatisfactory soils and materials designated as scrap shall be removed from project site and disposed according to paragraph 3.6 of this section. The Contractor shall indicate the approximate quantities of material he proposes to place in disposal site. In addition to the above requirements, the Contractor shall notify the Contracting Officer 24 hours in advance of the time he proposes

to start operations in the disposal area, and 48 hours in advance of any work which he proposes to do in the disposal area on Saturday, Sunday or legal holidays.

3.9.5.4 Spill Reporting

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

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

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

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

d. Nature of exposure to personnel.

e. Containment procedures initiated.

f. Anticipated cleanup and disposal procedure.

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

3.9.5.5 Environmental Assessment Requirement

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

3.9.6 Restrictions

3.9.6.1 Representatives of Other Agencies

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

3.9.6.2 Traffic Control Plan

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

routes, details of roadway restriping and signage for vehicular circulation, and parking details.

3.9.6.3 Existing Roads

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

3.9.6.4 Access and Haul Roads

Plans shall be submitted for approval for all proposed access and haul roads, whether within or outside the limits of the construction area, at least 15 calendar days prior to construction of such roads. The plans shall indicate width of road, direction of traffic, road markings, type of guardrail, curves, grades, runouts, and other information in sufficient detail for studying safety of the proposed roads. Haul roads shall be proposed so that use of existing residential streets and roads are minimized.

3.9.6.5 Public and Private Access Roads

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

3.9.6.6 Maintenance of Roads

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

3.9.6.7 Traffic Safety

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

3.9.6.8 Rock and Gravel

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

3.9.6.9 Cooperation with Others

In addition to CONTRACT CLAUSE: OTHER CONTRACTS, agreements shall be made for cooperative use and maintenance of project road directly between the Contractors concerned and shall be subject to approval by the Contracting Officer. No maintenance shall be charged for its use of the roads. During the life of this contract, the Contractor is advised that the activities of other contractors will require access to portions of the Project Limits. These activities are listed at the end of this section under, SPECIAL CONSTRUCTION REQUIREMENTS. The Contractor shall coordinate his activities and cooperate with other contractors as to not delay or interfere with their work.

3.9.6.10 Temporary Culverts

Temporary culverts shall be provided as required for road drainage. Temporary culverts shall be corrugated metal pipe of adequate diameter. Exact locations of the temporary culverts shall be subject to approval by the Contracting Officer.

a. All culverts within the construction area, including the borrow areas, shall be maintained to provide unrestricted flow through the culverts. Culvert maintenance shall include debris cleaning, repair of failures, and extension of culverts due to road alterations. Culvert maintenance shall be performed by the Contractor at no additional cost to the Government.

3.9.7 Working Hours

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

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

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

3.9.8 Construction Water

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

3.9.9 Lighting

The Contractor shall provide a minimum of 5 foot-candle lighting intensity for all construction areas during the contract performance period.

3.9.10 Identification of Vehicles

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

3.9.11 Construction Method Observation

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

3.9.12 Contractor's Equipment

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

3.10 PUBLIC SAFETY

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

installation of any general illumination shall not relieve the Contractor of his responsibility for furnishing and maintaining any protective facility.

3.11 OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) STANDARDS

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

3.11.1 Accident Reporting

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

3.12 PERMITS

3.12.1 General

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

3.12.2 Air Pollution Permit (APP)

The Contractor shall obtain an APP from the Clark County Health Department. For further information, contact Ms. Cynthia Mikes at telephone number (702) 383-1276.

3.12.3 National Pollutant Discharge Elimination System (NPDES) Permit

The Contractor shall obtain a NPDES permit from the United States Environmental Protection Agency (USEPA) under the Nation Wide Permit (NWP) program, which requires that a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and maintained on-site throughout the construction period. A copy of the plan will be submitted to the Contracting Officer. In accordance with the NWP, a minimum of two (2) days prior to the start of construction activities, the Contractor shall submit a Notice of Intent (NOI) with fees to the Nevada Division of USEPA. The NOI shall be submitted on the standard EPA Form 3510-6 (8-92), and copies shall be provided to the Contracting Officer. For further information, contact Mr. Robb Saunders at telephone number (702) 687-4670.

3.13 NOTICE OF PARTNERSHIP

The Government intends to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership

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

3.14 AS-BUILT DRAWINGS

3.14.1 General

The Contractor shall furnish the Government with as-built drawings in accordance with Section 01702, As-built Drawings. The as-built prints shall be a record of the construction as installed and completed by the Contractor. They shall include all the information shown on the contract set of drawings and a record of all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings, and all changes which are made after final inspection of the contract work. In event the Contractor accomplishes additional work which changes the as-built conditions. The requirements for these additional drawings will be the same as for the as-built drawings included in the original submission. The prints shall show the following information, but not be limited thereto:

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

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

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

e. Correct elevations if changes were made in site grading.

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

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

h. All changes or modifications which results from the final inspection.

3.14.2 Options

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

3.14.3 Submittal to Contracting Officer for review and approval

Submittal of as-builts drawings for review and approval by the Contracting Officer shall be in accordance with Section 01702, As-built drawings. The Contractor shall deliver to the Contracting Officer 1 full size sets of blueline prints marked up to depict as-built conditions. If upon review, the drawings are found to contain errors and/or omissions, they shall be returned to the Contractor for corrections. The Contractor shall complete the corrections and return the drawings to the Contracting Officer in accordance with the requirements specified in Sectiion 1702

3.15 DISPOSAL SITES

3.15.1 Disposal Site

Excess satisfactory excavated natural material not utilized as part of the construction shall be hauled, placed and compacted in disposal site per lines and grades shown on drawing Sheet 30. Materials characterized as unsatisfactory soil in accordance with Section 02200 EXCAVATION shall become the property of the Contractor and shall be removed from the project site.

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

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

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

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

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

MONTHLY ANTICIPATED ADVERSE WEATHER DAYS
Work Days Based on five (5) Day Work Week

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

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

3.17 REQUIRED INSURANCE

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

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

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

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

d. The Contractor, in addition to the insurance required above, will name as an additional insured the following individuals or their legal successors;

Victoria E. Cook, Trustee of the Cook Family Trust, U/A/D
Norman J. and Myia F. Yahraus,Ttrustees of the N & M Yahraus Trust

In every case the insurance coverage shall amount to at least the limits stated above. However, where the Financial Responsibility Compulsory Insurance Law of the State in which the installation is located requires higher limits, the Automobile Liability Insurance Policy should provide coverage of at least those limits. County of Clark, a political

subdivision of the state of Nevada, and Clark County Regional Flood Control District shall be named as additional insured parties and all policies issued in performance of work under this contract.

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

Contractor further does hereby agree, as a precaution to the performance of any work under this contract and as a precaution to any obligation of Clark County to make any payment under this contract, to provide Clark County with a certificate and/or a certificate issued by the State Industrial Insurance System (SIIS) in accordance with Nevada Revised Statute 616.280. Contractor agrees to maintain required workers compensation throughout the entire term of the contract. If Contractor does not maintain coverage throughout the entire term of the contract, Contractor agrees that Owner may, at any time the coverage is not maintained by Contractor, order the Contractor to stop work, assess liquidated damages as defined herein, suspend the contract, or terminate the contract. For each six month period this contract is in effect, Contractor agrees, prior to the expiration of the six month period, make another written request to SIIS for the provisions of a certificate and notice of lapse in or nonpayment of coverage. If Contractor does not make the request or does not provide the certificate before the expiration of the six month period, Contractor agrees that owner may order the Contractor to stop work, suspend the contract or terminate the contract.

3.18 SPECIAL CONSTRUCTION REQUIREMENTS

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

3.18.1 PROJECT LIMITS

The Contractor's work, employee parking, operations, staging, equipment assembly and maintenance, and other on-site activities shall be restricted to actual areas of construction within the Project Limits. The Project Limits of the Lower Flamingo Diversion Channel are indicated on the drawings, and constitute the maximum limits of the construction area available for Contractor's operations. The Project Limits are generally defined by the Rigt-of-Way (ROW) and adjoining Temporary Construction Easements (TCE) as shown on the plans, unless designated otherwise (either in the plans, in these Specifications or by the Contracting Officer). The Contractor shall be solely responsible for obtaining agreements with and acquisition from adjacent land owners, when additional land or access points are required to supplement the Contractor's operations or staging needs. No appurtenances or other public access facilities (either temporary or permanent) shall be constructed beyond the Project Limits.

3.18.2 ORDER OF CHANNEL CONSTRUCTION

Any continuation of the Contractor's operations in and access to those areas following issuance of the Notice to Proceed for the adjacent contract shall be requested in writing, and shall include:

1. a detailed critical-path scheduling diagram of the activities proposed,

2. a projected date of completion, and

3. a proposed method of coordination between potentially conflicting contract operations.

This information shall be reviewed by the Contracting Officer and if deemed acceptable, shall be approved by the Contracting Officer otherwise interim completions and restrictions listed below shall remain in effect.

3.18.2.1 Storm Runoff

In consideration of the potential for high-volume storm runoff occurring during the period of time when existing runoff patterns are disrupted, but the channel is not yet in service, the order of construction needs to be set to avoid significant erosive damage to elements of the project and existing facilities downstream.

The Contractor shall make all practical efforts to:

1. stage the construction of the channel from downstream to upstream (east to west), and

2. avoid long delays between excavation of the channel (and disruption of existing runoff patterns) and construction of the cast-in-place elements of the channel.

3. The Tropicana Detention Basin is an active flood control facility and at times during the construction of the Lower Flamingo Diversion Channel the Contractor should anticipate storm waters entering into the basin and corresponding work area(s) for the new channel. The potential high water elevation in the Tropicana Detention Basin is at an elevation of 698.00. Water ponding at this elevation may also travel back upstream into the new channel construction. The Contractor is responsible for protecting their new channel related work at all times during this contract.

3.18.2.2 Construction sequencing of RCB channel sections and Jones confluence.

The four RCB channel sections, the segment of the channel directly east of Jones Blvd. including the confluence and the Jones lateral shall be completed within 210 calendar days from the Lower Flamingo Diversion Channel notice to proceed. The RCB channel sections are located at Decatur Blvd. (Sta 14+57.095 to Sta 16+38.000), Russell Road (Sta 20+15.000 to Sta 20+82.000), Lindell Road (Sta 25+90.000 to Sta 26+35.000) and Jones Boulevard (Sta 33+63.526 to Sta 34+13.632). The Jones lateral is located

at Jones Blvd. (Sta 5+88.425 to Sta 7+32.923). The open channel and confluence are located at Jones Blvd. (Sta. 33+63.526 to Sta 32+36.570). Priorty on these features of work is necessary to meet Real Estate commitments and to restore normal traffic to these areas without delay.

3.18.2.3 Coordination with other Contractors and Agencies

Nevada Power is planning on expanding service in this area to include a new transmission line along Edmonds. Access to and through the channel site may be required at various times by Nevada Power or its contractors. The channel contractor shall be required to coordinate all construction activities with Nevada Power.

Road improvements for Jones Blvd are anticipated to commence in Feb 2001 under a separate contract administered by Clark County. These improvements which are actually on Jones south of Russell Road, will extend the current Jones alignment to the new Beltway to the south. Upon connecting Jones to the Beltway, the channel Contractor should anticipate a high volume traffic increase along the portion of Jones Blvd through the channel project right of way.

Improvements to Russell Road are anticipated to commence during the life of this contract via a separate contract administered by the Clark County. The Russell Road improvements will extend between Decatur and Rainbow Blvd to the west. The channel contractor shall be required to coordinate and share the common work areas between these contracts, to include the Edmonds/Russell crossing and the Disposal Site. The portion of the Disposal Site within the Russell Road alignment may require an early completion so as not to delay the separate Russell Road Clark County project. The Russell Road project is currently scheduled to commence in May 2001.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 CONTRACT PRICE AND PAYMENT
1.2 LUMP SUM PAYMENT ITEMS
1.3 UNIT PRICE PAYMENT ITEMS

PART 2 TRAFFIC CONTROL.

PART 3 DIVERSION AND CONTROL OF WATER.

PART 4 CLEAR SITE AND REMOVE OBSTRUCTIONS.

PART 5 EXCAVATION.

5.1 Measurement.
5.2 Payment.
5.3 Unsatisfactory Soils
5.4 Excavation for Structures
5.5 Excavation for Utilities
5.6 Shoring

PART 6 FILLS.

6.1 Measurement.
6.2 Payment.
6.2.1 Compacted Fill, Channel.
6.2.2 Compacted Fill, Disposal Site.
6.2.3 Fill for Structures.
6.2.4 Trenches.
6.2.5 Subgrade Preparation.

PART 7 CONCRETE.

7.1 Measurement.
7.2 Payment.
7.2.1 Concrete, Invert Slab.
7.2.2 Concrete, Side Slope.
7.2.3 Concrete, Cut-off Wall.

7.2.4 Concrete, Walls.
7.2.5 Concrete, Transition
7.2.6 Concrete Overflows

PART 8 TRAPEZOIDAL TO RECTANGULAR TRANSITION, STA. 11+20.000 to STA. 11+80.000

PART 9 BOX CULVERT, STA. 14+57.095 to STA. 16+38.000

PART 10 INVERT ACCESS RAMP, STA. 18+14.686 to STA. 18+77.224

PART 11 BOX CULVERT, STA. 20+15.000 STA. 20+82.000

PART 12 BOX CULVERT, STA. 25+90 to STA. 26+35

PART 13 INVERT ACCESS RAMP, STA. 31+30.000 to STA. 31+82.773

PART 14 CONFLUENCE/INVERT TRANSITION, STA. 32+63.570 to STA. 32+94.570

PART 15 BOX CULVERT, STA. 33+63.526 to STA. 34+13.632

PART 16 JONES LATERAL, STA 5+88.425 to STA 7+32.923

PART 17 REINFORCING STEEL

17.1 Measurement.
17.2 Payment.

PART 18 AGGREGATE BASE COURSE.

18.1 Measurement.
18.2 Payment.

PART 19 ASPHALT CONCRETE PAVEMENT.

19.1 Measurement.
19.2 Payment.

PART 20 STONE PROTECTION

20.1 Measurement
20.2 Payment

PART 21 WEEPHOLE SYSTEM.

PART 22 INVERT ACCESS LADDERS.

PART 23 SIDE DRAINS

PART 24 ROAD DETOURS @ DECATUR BLVD.

PART 25 UTILITIES @ DECATUR BLVD.

PART 26 ROAD DETOURS @ LINDELL BLVD.

PART 27 UTILITIES @ LINDELL BLVD.

PART 28 ROAD DETOURS @ JONES BLVD.

PART 29 UTILITIES @ JONES BLVD.

PART 30 UTILITIES @ RUSSELL ROAD

PART 31 CHAIN LINK FENCING.

31.1 Measurement.
31.2 Payment.

PART 32 PIPE SAFETY HAND RAIL

PART 33 DOUBLE SWING GATES.

33.1 Measurement
33.2 Payment.

PART 34 SOIL STABILIZER

34.1 Measurement.
34.2 Payment

PART 35 STATION MARKINGS

PART 36 AS-BUILT DRAWINGS

-- End of Section Table of Contents --

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 CONTRACT PRICE AND PAYMENT

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

1.2 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.3 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

PART 2 TRAFFIC CONTROL.

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

PART 3 DIVERSION AND CONTROL OF WATER.

Payment for Diversion and Control of Water will be made at the applicable contract price, which payment shall constitute full compensation for maintaining the work area in a dry condition.

PART 4 CLEAR SITE AND REMOVE OBSTRUCTIONS.

Payment shall include all costs for clearing, removal, replacement, and restoration work (except work by others) including all existing obstructions within the construction work area. Except as otherwise specified, payment for clearing and removal work includes applicable earthwork; filling holes; removal of abandoned utility lines; removal of existing surface trash and debris, including trees and vegetation, and grubbing from within the Channel right-of-way and temporary construction easement; protection, replacement or restoration of existing structures and features indicated and disposal of all materials. Payment for Clear Site and Remove Obstructions will be made at the applicable contract price, which payment shall constitute full compensation for clearing, obstruction removal, and protection work, complete.

PART 5 EXCAVATION.

5.1 Measurement.

A survey of the site shall be made prior to commencement of work, and all measurements will be based on this survey without regard to any changes in the site that may be made between the excavation lines and grades indicated on the drawings or staked in the field and the ground surfaces as indicated by the above mentioned survey. The quantity of directed excavation necessary for the removal of unsatisfactory foundation material as specified shall be included in the measurement of the excavation where the unsuitable soils are encountered. Quantities will be computed in cubic meters by the average end area method and the planimeter will be considered a precise instrument for measurement of plotted cross sections. The total quantity of excavated material for which payment will be made will be the theoretical quantity between the ground surface as determined by a survey and the grade and slope of the theoretical cross sections indicated. No allowance will be made for overdepth excavation or for the removal of any material outside the required slope lines. All excavation outside of excavation lines shown on the drawings will be considered as being for the convenience of the Contractor.

5.2 Payment.

Payment will be made for costs associated with excavation for the channel at the applicable contract price, which payment shall constitute full compensation for excavating the channel, and other areas as indicated on the drawings, including shoring, rock removal, and cemented alluvium excavation; shaping and trimming of areas to receive concrete; crushing or otherwise processing, loading, stockpiling, hauling, and placing suitable materials for compacted fill; Including crushing/processing, loading, hauling, placing excess satisfactory excavated materials at disposal site shown on drawing sheet 30. Payment will not be included for excavation

(including shoring) outside the excavation limits indicated on the drawings or staked in the field, and other excavation requirements for which separate payments are provided.

5.3 Unsatisfactory Soils

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

5.4 Excavation for Structures

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

5.5 Excavation for Utilities

No separate payment will be made for excavation for utilities. All costs therefore shall be included in the applicable contract item to which the work applies.

5.6 Shoring

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

PART 6 FILLS.

6.1 Measurement.

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

6.2 Payment.

6.2.1 Compacted Fill, Channel.

Payment for compacted fill will be made at the applicable contract price, which payment shall constitute full compensation for shaping, grading, filling behind the channel walls including access ramps, over covered channels, and other areas shown on the drawings, and compacting the fill, complete. Payment will not be included for fills outside the fill limits indicated on the drawings or staked in the field, and other fill requirements for which separate payments are provided.

6.2.2 Compacted Fill, Disposal Site.

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

6.2.3 Fill for Structures.

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

6.2.4 Trenches.

No separate payment will be made for backfilling for utilities, side drains and confluences. All costs in connection therewith shall be included in the contract prices for items to which the work applies.

6.2.5 Subgrade Preparation.

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

PART 7 CONCRETE.

7.1 Measurement.

Measurement of concrete will be made on the basis of the actual volume, in cubic yards, of concrete within the pay lines of the concrete invert slab, walls, top slab, and slope protection as shown on the drawings. Measurement of concrete placed against the sides of any excavation without the use of intervening forms will be made only within the pay lines of the structures. No deductions will be made for rounded or beveled edges or space occupied by metalwork, nor voids or embedded items which are either less than 0.15 cubic meter in volume or one-tenth of square meter in cross section. Concrete placed in items of work other than those specifically mentioned above, and concrete wasted or used for the convenience of the Contractor will not be included in measurement for payment.

7.2 Payment.

Payment for the concrete items will be made at the applicable contract prices for the various items of the schedule, which payments shall constitute full compensation for labor, materials (except reinforcing steel for which separate payment is provided), joint sealant, forming, furnishing, curing, and for all equipment and tools to complete the concrete work. Embedded items shall be included in the cost of the concrete except when other payment is specifically provided. No payment will be made for concrete, as such, which is placed in structures for which payment is made on a lump sum basis.

7.2.1 Concrete, Invert Slab.

Payment for "concrete, invert slab" will be made at the applicable contract price, which shall constitute full compensation for all concrete placed for the invert slab of the channel, keys, and starter walls, complete.

7.2.2 Concrete, Side Slope.

Payment for "concrete, side slope" will be made at the applicable contract price, which payment shall constitute full compensation for all concrete placed in the trapezoidal channel side slopes, excluding the cut-off walls, complete.

7.2.3 Concrete, Cut-off Wall.

Payment for "concrete, cut-off wall" will be made at the applicable contract price, which payment shall constitute full compensation for all concrete placed in the cut-off walls along the trapezoidal channel (sta. 10+30.000 to sta. 11+20.000, complete.

7.2.4 Concrete, Walls.

Payment for "concrete, walls" will be made at the applicable contract price, which payment shall constitute full compensation for all concrete placed above the starter walls in the vertical walls of the channel, the walls of the warped transition structures, complete.

7.2.5 Concrete, Transition

Payment for "concrete, transition" and all costs in connection therewith shall be included in the contract prices for "concrete walls" and "concrete, invert slab" or to the applicable contract price for which the work applies.

7.2.6 Concrete Overflows

Payment for the "concrete overflows" will be made at the applicable contract price, which payment shall constitute full compensation for all concrete placed for concrete overflow, concrete drainage structure, concrete maintenance road, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; furnishing and placing aggregate base course, including the grouted stone for concrete overflow, complete except earthwork.

PART 8 TRAPEZOIDAL TO RECTANGULAR TRANSITION, STA. 11+20.000 to STA. 11+80.000

Payment for the "trapezoidal to rectangular transition" (Sta. 11+20.000 to Sta. 11+80.000) will be made at the applicable contract price, which payment shall constitute full compensation for the trapezoidal to rectangular transition except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, complete as shown on the drawings except for pipe safety hand rail, and chain link fencing.

PART 9 BOX CULVERT, STA. 14+57.095 to STA. 16+38.000

Payment for the "concrete box culvert (Sta. 14+57.095 to Sta. 16+38)" will be made at the applicable contract price, which payment shall constitute full compensation for the box culvert except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, headwalls; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, and chain link fencing.

PART 10 INVERT ACCESS RAMP, STA. 18+14.686 to STA. 18+77.224

Payment for the "invert access ramp" also includes the adjacent open channel from Sta. 18+14.686 to Sta. 18+77.224. Payment will be made at the applicable contract price, which payment shall constitute full compensation for the invert access ramp and open channel except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, chain link fencing, and double swing gate.

PART 11 BOX CULVERT, STA. 20+15.000 STA. 20+82.000

Payment for the "concrete box culvert (Sta. 20+15 to Sta. 20+82)" will be made at the applicable contract price, which payment shall constitute full compensation for the box culvert and head walls except earthwork, complete, including; furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, headwalls; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, chain link fencing, and double swing gate.

PART 12 BOX CULVERT, STA. 25+90 to STA. 26+35

Payment for the "concrete box culvert (Sta. 25+90 to Sta. 26+35)" will be made at the applicable contract price, which payment shall constitute full compensation for the box culvert except earthwork, complete, including , furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, headwalls; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, chain link fencing, and double swing gate.

PART 13 INVERT ACCESS RAMP, STA. 31+30.000 to STA. 31+82.773

Payment for the "invert access ramp" also includes the adjacent open channel from Sta. 31+30.000 to Sta. 31+82.773. Payment will be made at the applicable contract price, which payment shall constitute full compensation for the invert access ramp and open channel except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, chain link fencing, and double swing gate.

PART 14 CONFLUENCE/INVERT TRANSITION, STA. 32+63.570 to STA. 32+94.570

Payment for the "confluence/invert transition" (Sta. 32+63.570 to Sta. 32+94.570) will be made at the applicable contract price, which payment shall constitute full compensation for the confluence/invert transition except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, chain link fencing and double swing gate.

PART 15 BOX CULVERT, STA. 33+63.526 to STA. 34+13.632

Payment for the concrete box culvert (Sta. 33+63.526 to Sta. 34+13.632) will be made at the applicable contract price, which payment shall constitute full compensation for the box culvert except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, headwalls; and all incidentals, complete as shown on the drawings except for pipe safety hand rail, chain link fencing and double swing gate.

PART 16 JONES LATERAL, STA 5+88.425 to STA 7+32.923

Payment for Jones Boulevard lateral (Sta. 5+88.425 to Sta. 7+32.923) will be made at the applicable contract price, which payment shall constitute full compensation for the box culvert and stub-outs except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings. The open channel from sta. 32+94.570 to sta. 33+22.682 is not part of this bid item .

PART 17 REINFORCING STEEL

17.1 Measurement.

Measurement of reinforcing steel in metric tonnes (1,000 kilograms) is limited to reinforcement in concrete structures paid for on a cubic meters basis. Measurement will be made of the lengths of bars actually placed in the completed work in accordance with the plans and specifications, approved bar schedules, or as directed. The measured lengths will converted to weights for the bar numbers listed by the unit weights per linear foot contained in ASTI A 615. Steel in laps indicated on the drawings, in the specifications, or required by the Contracting Officer will be included in measurement for payment. No measurement will be made for the additional steel in laps which are authorized for the convenience of the Contractor. No measurement will be made of steel supports or spacers. All costs for furnishing and installing supports and spacers shall be included in the various structures requiring the reinforcement.

17.2 Payment.

Payment for reinforcing steel will be made at the applicable contract price, which payment shall constitute full compensation for furnishing and installing steel reinforcement, complete. No payment will be made for steel reinforcement which is placed in structures for which payment is made on a lump sum basis.

PART 18 AGGREGATE BASE COURSE.

18.1 Measurement.

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

18.2 Payment.

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

PART 19 ASPHALT CONCRETE PAVEMENT.

19.1 Measurement.

Measurement for asphalt concrete pavement will be by the metric tonne (1,000 kilograms) of asphalt concrete pavement placed within the lines and grades as indicated on the drawing.

19.2 Payment.

Payment for asphalt concrete pavement will be made at the applicable contract price which payment shall constitute full compensation for asphalt concrete pavement in place, complete including tack coat, prime coat and appurtenant work except for aggregate base course. No payment will be made for excessive thickness.

PART 20 STONE PROTECTION

20.1 Measurement

The quantity of stone to be paid for will be the number of metric tonne (1,000 kilograms), determined by scale weights, acceptably placed within the lines and grades shown on the drawings or directed by the Contracting Officer.

20.2 Payment

Payment for Stone Protection, of the various types will be made at the applicable contract unit prices, per metric tonne (1000 kg), which prices shall constitute full compensation for obtaining and placing the materials, complete.

PART 21 WEEPHOLE SYSTEM.

Payment for the weephole system will be made at the applicable contract price, which payment shall constitute full compensation for materials, and installation of the weephole system, complete including applicable earthwork, drain aggregate, geotextile, form openings and appurtenances, complete.

PART 22 INVERT ACCESS LADDERS.

Payment for "invert access ladders" will be made at the applicable contract lump sum price, and shall be considered full payment for fabrication, assembly fittings, finishing, paint, and markings. Installation and all equipment, labor and fittings needed for such shall be considered incidental to the contract price for the concrete item to which the ladder is attached.

PART 23 SIDE DRAINS

Payment for side drain and stub-outs will be made at the applicable contract price, which payment shall constitute full compensation for the side drain and stub-outs, complete, as shown on the drawings, including earthwork; furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete for the side drain junction structures and inlet structure; furnishing and placing concrete pipe, fittings and end sections; furnishing and placing riprap; and placing temporary pipe barriers for stub-outs. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided and no payment will be made under this item for inlets, grates, concrete, and concrete pipe for which separate payment is provided.

PART 24 ROAD DETOURS @ DECATUR BLVD.

Payment for "detour roads @ Decatur Blvd." will be made at the applicable contract lump sum price, and shall be considered full payment for saw cutting, demolition, removal, hauling and disposal of asphaltic concrete; all required excavation and compacted fill; furnishing and placing the aggregate base course, complete, including subgrade preparation; asphalt concrete pavement in place, complete, including tack coat, prime coat and appurtenant work such as pavement markings; and traffic control and signage.

PART 25 UTILITIES @ DECATUR BLVD.

Payment for "utilities at Decatur Blvd." will be made at the applicable contract price, which payment shall constitute full compensation for relocations and protection of existing utilities, complete. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

PART 26 ROAD DETOURS @ LINDELL BLVD.

Payment for "detour roads @ Lindell Blvd." will be made at the applicable contract lump sum price, and shall be considered full payment for saw cutting, demolition, removal, hauling and disposal of asphaltic concrete; all required excavation and compacted fill; furnishing and placing the aggregate base course, complete, including subgrade preparation; asphalt concrete pavement in place, complete, including tack coat, prime coat, concrete approach slabs, curb and gutter, sidewalk, and appurtenant work such as pavement markings; and traffic control and signage.

PART 27 UTILITIES @ LINDELL BLVD.

Payment for "utilities at Lindell Blvd." will be made at the applicable contract price, which payment shall constitute full compensation for relocations and protection of existing utilities, complete. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

PART 28 ROAD DETOURS @ JONES BLVD.

Payment for "detour roads @ Jones Blvd." will be made at the applicable contract lump sum price, and shall be considered full payment for saw cutting, demolition, removal, hauling and disposal of asphaltic concrete; all required excavation and compacted fill; furnishing and placing the aggregate base course, complete, including subgrade preparation; asphalt concrete pavement in place, complete, including tack coat, prime coat and appurtenant work such as pavement markings; and traffic control and signage.

PART 29 UTILITIES @ JONES BLVD.

Payment for "utilities at Jones Blvd." will be made at the applicable contract price, which payment shall constitute full compensation for relocations and protection of existing utilities, complete. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

PART 30 UTILITIES @ RUSSELL ROAD

Payment for "utilities at Russell Road" will be made at the applicable contract price, which payment shall constitute full compensation for relocations and protection of existing utilities, complete. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

PART 31 CHAIN LINK FENCING.

31.1 Measurement.

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

31.2 Payment.

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

PART 32 PIPE SAFETY HAND RAIL

Payment for "PIPE SAFETY HAND RAIL" will be made at the applicable contract price which payment shall constitute full compensation for materials, and installation necessary for the pipe safety hand rail, including pipe railing and post, sleeves, coil chain gates , fabrication, grounding, and

all incidentals, complete in place.

PART 33 DOUBLE SWING GATES.

33.1 Measurement

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

33.2 Payment.

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

PART 34 SOIL STABILIZER

34.1 Measurement.

Measurement of "soil stabilizer" will be made on the basis of the actual area in square meters of exposed excavation and fill surfaces in the construction areas treated with soil stabilizer as indicated or directed.

34.2 Payment

Payment for "soil stabilizer" will be at the applicable contract price, which payment shall constitute full compensation for the soil stabilizer including materials, processing, hauling, and placing, complete in place.

PART 35 STATION MARKINGS

Payment for station markings will be made at the applicable contract lump sum price, and shall be considered full payment for materials, and installation necessary for the work, including; surface preparation, paint, stencils, labor, and equipment, and all incidentals, complete in place.

PART 36 AS-BUILT DRAWINGS

Payment for As-built drawings will be made at the applicable contract price which payment shall constitute full compensation for all costs incurred by the Contractor in the preparation and furnishing of approved as-built drawings in Bentley Microstation electronic file format.

-- End of Section --

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
01354

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			3.7	Retention Pond Removal Plan					X							X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
01702

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.1	As-built Drawings		X										X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02241

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES: REPORTS k.	CERTIFICATES: SAMPLES l.	CERTIFICATES: SAMPLES m.	O&M: RECORDS n.	O&M: MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	CLASSIFICATION: GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	CONTRACTOR SCHEDULE DATES: APPROVAL NEEDED BY t.	CONTRACTOR SCHEDULE DATES: MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	CONTRACTOR ACTION: DATE w.	CONTRACTOR ACTION: SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	GOVERNMENT ACTION: DATE z.	REMARKS aa.
			1.4	Plant, Equipment, Machines, and Tools	X										X											
			1.4	Sampling and Testing						X						X										
			1.4	Field Density						X						X										
			1.4	Waybills and Delivery Tickets									X			X										
			1.4	Coarse Aggregate									X			X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02250

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.3	Field Density Tests						X						X										
			1.3	Treating of Compacted Fill Materials						X						X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02316

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES: REPORTS k.	CERTIFICATES: SAMPLES l.	O&M: RECORDS n.	O&M: MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	CLASSIFICATION: GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	CONTRACTOR SCHEDULE DATES: APPROVAL NEEDED BY t.	CONTRACTOR SCHEDULE DATES: MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	CONTRACTOR ACTION: DATE w.	CONTRACTOR ACTION: SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	GOVERNMENT ACTION: DATE z.	REMARKS aa.
			3.4.3	Field Density Tests						X					X										
			3.4.2	Testing of Backfill Materials						X					X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02600

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES: REPORTS k.	CERTIFICATES: SAMPLES l.	CERTIFICATES: SAMPLES m.	O&M: RECORDS n.	O&M: MANUALS o.	CLASSIFICATION: INFORMATIONONLY p.	CLASSIFICATION: GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	CONTRACTOR SCHEDULE DATES: APPROVAL NEEDED BY t.	CONTRACTOR SCHEDULE DATES: MATERIAL NEEDED BY u.	CONTRACTOR SCHEDULE DATES: CODE v.	CONTRACTOR ACTION: DATE w.	CONTRACTOR ACTION: SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	GOVERNMENT ACTION: DATE z.	REMARKS aa.
			1.1	Source of Stone	X											X										
			1.1	Testing Facilities	X											X										
			1.1	Method of Placement					X							X										
			1.1	Gradation Testing						X					X											
			1.1	Stone Quality								X			X											
			1.1	Waybills and Delivery Tickets									X		X											

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02650

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.2	Grout Mix Design						X						X										
			1.2	Portland Cement							X					X										
			1.2	Curing Materials							X					X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02700

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	O&M MANUALS n.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERNMENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.1	Placing Pipe			X								X										
			1.1	Pipeline Testing							X				X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02710

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.2	Filter Material								X			X											

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02741

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES: REPORTS k.	CERTIFICATES: SAMPLES l.	CERTIFICATES: SAMPLES m.	O&M: RECORDS n.	O&M: MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	CLASSIFICATION: GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	CONTRACTOR SCHEDULE DATES: APPROVAL NEEDED BY t.	CONTRACTOR SCHEDULE DATES: MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	CONTRACTOR ACTION: DATE w.	CONTRACTOR ACTION: SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	GOVERNMENT ACTION: DATE z.	REMARKS aa.
			1.2	Asphaltic Cement						X						X										
			1.2	Gradation and Physical Properties of Aggregates						X						X										
			1.2	Bituminous Pavement Mix Design						X						X										
			1.2	Properties of Bituminous Pavement Mixture						X						X										
			1.2	Report of Density, Asphalt Content, and Gradation						X						X										
			1.2	Report of Grade Conformance and Surface Smoothness						X						X										
			1.11	Waybills and Delivery Tickets										X		X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02748

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.3	Sampling and Tests						X					X											
			1.3	Waybills and Delivery Tickets									X			X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
02821

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.2	Chain Link Fence						X						X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
03101

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			2.1	Materials	X										X											
			1.3	Shop Drawings		X										X										
			1.3	Shop Drawings					X							X										
			3.3	Inspection						X					X											
			1.3	Formwork Not Supporting the Weight of Concrete						X						X										
			1.3	shop drawings						X																

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
03151

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			2.1.1	Premolded Expansion Joint Filler Strips						X						X										
			2.1.2.2	Compression Seals and Lubricant						X						X										
			1.2	Field Molded Sealant and Primter						X						X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
03210

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			3.1	Fabrication and Placement		X										X										
			2.1	Materials						X						X										
			1.2	Tests, Inspections, and Verifications						X						X										

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
03301

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO. c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	CERTIFICATES k.	REPORTS l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.2	Concrete Mixture Proportions	X										X											
			1.2	Concrete Mixers	X										X											
			1.2	Conveying Equipment and Methods	X										X											
			1.2	Testing Technicians					X																	
			1.2	Concrete Construction Inspector					X						X											
			1.2	Construction Joint Treatment					X							X										
			1.2	Curing and Protection					X							X										
			1.2	Cold-Weather Placing					X							X										
			1.2	Hot-Weather Placing					X							X										
			1.2	Aggregate Quality						X						X										
			1.2	Uniformity of Concrete Mixing						X					X											
			1.2	Tests and Inspections						X					X											
			1.2	Cementitious Materials							X					X										
			1.2	Other Chemical Admixtures							X				X											
			1.2	Membrane-Forming Curing Compound							X				X											
			1.2	Epoxy Resin							X				X											
			1.2	Latex Bonding Compound							X				X											
			1.2	Nonshrink Grout							X				X											

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
Lower Flamingo Diversion Channel

CONTRACTOR

SPECIFICATION SECTION
05500

ACTIVITY NO. a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.2	Miscellaneous Metal Items		X										X										

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01702

AS-BUILT DRAWINGS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 AS-BUILT FIELD DATA
3.1.1 General
3.1.2 Preliminary As-Built Drawings
3.1.2.1 Submittal of the As-Built Field Data
3.2 AS-BUILT ELECTRONIC FILE DRAWINGS
3.2.1 General
3.2.2 Original Files
3.2.3 Electronic File Submittal Requirements
3.2.3.1 File Submittals
3.2.3.2 Drawing Format
3.2.3.3 Electronic File Deliverable Media
3.3 FINAL AS-BUILT DRAWINGS

-- End of Section Table of Contents --

SECTION 01702
AS-BUILT DRAWINGS

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.

CORPS OF ENGINEERS ENGINEERING MANUAL (EM)

EM 1110-1-1807	(1990) Standards Manual for U.S. Army Corps M 111 - 18 of Engineers Computer-Aided Design and Drafting (CADD) Systems

1.2 SUBMITTALS

Data listed in PART 3 of this section shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES. Due dates shall be as indicated in applicable paragraphs and all submittals shall be completed before final payment will be made.

SD-04 Drawings

As-built Drawings; GA

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 AS-BUILT FIELD DATA

3.1.1 General

The Contractor shall prepare and furnish the as-built drawings for the project. The as-built drawings shall be a record of the construction as installed and completed by the Contractor. They shall include all the information shown on the contract set of drawings and a record of all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings, and all changes which are made after final inspection of the contract work. In event the Contractor accomplishes additional work which changes the as-built conditions of the facility after

submission of the as-built drawings, the Contractor shall furnish revised and/or additional drawings as required to depict as-built conditions. The requirements for these additional drawings will be the same as for the asbuilt drawings included in the original submission. The drawings shall show the following information, but not be limited thereto:

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

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

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

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

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

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

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

(h) Where contract drawings or specifications allow options, only the option
actually used in the construction shall be shown on the as-built drawings. The option not used shall be deleted.

3.1.2 Preliminary As-Built Drawings

The Contractor shall maintain one (1) set of full size, blueline prints marked up in red to show the as-built conditions. This set of as-built prints shall be kept current and available at the job site at all times, All changes from what is shown on the contract plans, whether it be from changes requested by the Contracting Officer or resulting from additionali information which might be uncovered in the course of construction, shall be accurately and neatly recorded as they occur by means of details and notes. The marked-up as-built prints will be jointly inspected for accuracy and completeness by the Contracting Officer and Contractor prior to submission of each monthly pay estimate. Failure to keep the As-Built Field Data current shall be sufficient justification to withhold a retained percentage from the monthly pay estimate. Information to be included on these preliminary drawings shall conform to the requirements as stated above. Any and all as-built modifications shall be reflected on ail sheets affected by the modifications.

3.1.2.1 Submittal of the As-Built Field Data

One (1) full size set of marked up drawings with the as-built field data shall be submitted to the Contracting Officer for review and approval a minimum of 20 calendar days prior to the date of final inspection. If review of the preliminary as-built drawings reveals errors and/or omissions, the drawings will be returned to the Contractor for corrections. The Contractor shall make all corrections and return the drawings to the Contracting Officer within 10 calendar days of receipt.

3.2 AS-BUILT ELECTRONIC FILE DRAWINGS

3.2.1 General

No later than 30 days after final acceptance a complete set of as-built drawings shall be submitted in Intergraph MicroStation electronic file format. The as-built drawings shall be done in a quality equal to that of the originals. Line work, line weights, and lettering, and use of symbols shall be the same as the original line work, line weights, and lettering, and symbols. If additional drawings are required they shall be prepared in electronic file format under the same guidance. When final revisions have been completed, each drawings shall be identified with the words "ASBUILT" in blockletters at least 3/8-inch high placed above the title block if space permits, or if not, below the title block between the border and the trim line. The date of completion and the words "REVISED AS-BUILT" shall be placed in the revision block above the latest revision notation.

3.2.2 Original Files

Upon Contractor's request the Government will provide the Contractor one set of Bentley MicroStation electronic file format (DGN Files) contract drawings, to be used for asbuilt drawings. The electronic file drawings will be available on CD-ROM media.

3.2.3 Electronic File Submittal Requirements

3.2.3.1 File Submittals

The MicroStation electronic file(s) deliverable shall be in MicroStation version SE or J 'DGN' binary format. All support files required to display or plot the file(s) in the same manner as they were developed shall be delivered along with the files. These files include but are not limited to Font Libraries, Pen Tables, and Referenced files.

3.2.3.2 Drawing Format

Layering shall be performed in accordance with EM Standards Manual for U.S. Army Corps of Engineers Computer-Aided Designand Drafting (CADD) Systems. An explanatory list of which layer is used at which drawing and an explanatory list of all layers which do not conform to the guidelines shall be provided with each submittal.

3.2.3.3 Electronic File Deliverable Media

All electronic files shall be submitted on CD-ROM media. Two complete sets of disks shall be submitted along with one complete set of prints taken from the disks. Each disk shall be clearly marked with type written self adhesive disk labels which shall contain the following information: Contractor's firm name, project name and location, submittal type (ASBUILT), the name of each file contained within the disk or archive file, the format and version/release number of each file, a disk number indicating the numeric sequence of the disk in the submittal along with the total number of disks in the submittal, and date the disk was made. Due to the limited ability to mark on CD-ROM media, only the Contractor's firm name, project name and location, submittal type (AS-BUILT) and date will be required. Each submittal shall be accompanied by a hard copy transmittal sheet that contains the above information along with a description of each file provided in the submittal.

3.3 FINAL AS-BUILT DRAWINGS

The final as-built record drawings shall be completed and returned together with the approved preliminary as-built drawings to the Contracting Officer within 30 calendar days of final acceptance. The Contracting Officer will review all final as-built record drawings for accuracy and conformance to the drafting standards and other requirements contained in DIVISION 1 GENERAL REQUIREMENTS. The drawings shall be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall return the drawings to the Contracting Officer within 5 calendar days of receipt. Upon final approval, the Contractor shall furnish two (2) full size sets and two (2) half size sets of the final as-built plans on reproducible mylars, and the electronic as-buiit project files. All project files, whether revised or not, shall be provided to the Contracting Officer.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02316

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS

PART 1 GENERAL

1.1 REFERENCES
1.2 MEASUREMENT AND PAYMENT
1.3 DEGREE OF COMPACTION
1.4 SUBMITTALS

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Satisfactory Materials
2.1.2 Unsatisfactory Materials
2.1.3 Cohesionless and Cohesive Materials
2.1.4 Unyielding Material
2.1.5 Unstable Material
2.1.6 Select Granular Material
2.1.7 Initial Backfill Material
2.2 PLASTIC MARKING TAPE

PART 3 EXECUTION

3.1 EXCAVATION
3.1.1 Trench Excavation Requirements
3.1.1.1 Bottom Preparation
3.1.1.2 Removal of Unyielding Material
3.1.1.3 Removal of Unstable Material
3.1.1.4 Excavation for Appurtenances
3.1.1.5 Jacking, Boring, and Tunneling
3.1.2 Stockpiles
3.2 BACKFILLING AND COMPACTION
3.2.1 Trench Backfill
3.2.1.1 Replacement of Unyielding Material
3.2.1.2 Replacement of Unstable Material
3.2.1.3 Bedding and Initial Backfill
3.2.1.4 Final Backfill
3.2.2 Backfill for Appurtenances
3.3 SPECIAL REQUIREMENTS
3.3.1 Gas Distribution
3.3.2 Water Lines
3.3.3 Plastic Marking Tape
3.4 TESTING

3.4.1 Testing Facilities
3.4.2 Testing of Backfill Materials
3.4.3 Field Density Tests
3.4.4 Displacement of Sewers

-- End of Section Table of Contents --

SECTION 02316

EXCAVATION, TRENCHING, AND BACKFILLING FOR 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 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/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 2487	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.2 MEASUREMENT AND PAYMENT

No separate payment will be made for trench excavation and trench backfll for utilities. All costs in connection therewith shall be included in the contract prices for items to which the work applies.

1.3 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 1557.

1.4 SUBMITTALS

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

SD-09 Reports

Field Density Tests; GA. Testing of Backfill Materials; GA.

Copies of all laboratory and field test reports within 24 hours of the completion of the test.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Satisfactory Materials

Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GM, GC, SW, SP, SM, SC and CL.

2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified by ASTM D 2487 as CH, PT, OH, MH, and OL and satisfactory material which contains root and other organic matter, and frozen material. The Contracting Officer shall be notified of any contaminated materials.

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 shall include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM shall be identified as cohesionless only when the fines are nonplastic.

2.1.4 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than 75 millimeters in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.5 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

2.1.6 Select Granular Material

Select granular material shall consist of well-graded sand, gravel, crushed gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall contain not more than 10 percent by weight of material passing a 0.075 mm mesh sieve and no less than 95 percent by weight passing the 25 mm sieve. The maximum allowable aggregate size shall be 13 millimeters, or the maximum size recommended by the pipe manufacturer, whichever is smaller.

2.1.7 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory materials free from rocks 25 millimeters or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller. When the pipe is coated or wrapped for corrosion protection, the initial backfill material shall be free of stones larger than 13 millimeters in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be acid and alkali-resistant polyethylene film, 150 mm wide with minimum thickness of 0.100 mm). Tape shall have a minimum strength of 12.1 MPa lengthwise and 10.3 MPa crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 1 meter deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility.

TABLE 1. Tape Color

Red:	Electric
Yellow:	Gas, Oil, Dangerous Materials
Orange:	Telephone, Telegraph, Television, Police, and Fire Communications
Blue:	Water Systems
Green:	Sewer Systems

PART 3 EXECUTION

3.1 EXCAVATION

Excavation shall be performed to the lines and grades indicated. Excavation shall consist of the removal of every type of material encountered. The material to be removed may include but is not limited to hardpan, silt, sand, gravel, cobbles and boulders, cemented silt/sand/gravel/cobbles/boulders with various degrees of cementation, caliche, asphalt, vegetation, trash, and other debris. Excavation may require ripping or other rock-excavation techniques. Use of the heavy tractors equipped with a ripper tooth, hoe-rams, and hydraulic or pneumatic rock breaker could be necessary to excavate highly cemented soils. Rock or cemented material from required excavation to be used in compacted fills and backfills shall be crushed or otherwise reduced in size to meet gradation requirements prior to placement or stockpiling. During excavation, material satisfactory for backfilling shall be stockpiled in an orderly manner at a distance from the banks of the trench equal to 1/2 the depth of the excavation, but in no instance closer than 600 mm. Excavated material not satisfactory for backfill shall become property of the contractor and removed from the project site. Excess (satisfactory) excavated materials shall be hauled, placed and compacted in disposal site per lines and grades shown on the drawing sheet 30. Excess excavated materials including rocks and cemented soils shall be processed/crushed or

otherwise reduced in sizes not exceeding 3/4 of lift thickness, prior to hauling and placing in disposal site. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized overexcavation shall be backfilled in accordance with paragraph BACKFILLING AND COMPACTION at no additional cost to the Government.

3.1.1 Trench Excavation Requirements

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 1.5 meters 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 1.5 meters 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 600 mm plus pipe outside diameter (O.D.) for pipes of less than 600 mm inside diameter and shall not exceed 900 mm plus pipe outside diameter for sizes larger than 600 mm 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 without any additional cost to the Government.

3.1.1.1 Bottom Preparation

The bottoms of trenches shall be accurately graded to provide uniform bearing and support. The trench subgrade shall not vary more than 13 millimeters from the indicated grade. Stones of 75 millimeters 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 [overdepth is not indicated and] unyielding material is encountered in the bottom of the trench, such material shall be removed 150 millimeters below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.1.1.3 Removal of Unstable Material

Where 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 BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Government.

3.1.1.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be [sufficient to leave at least 300 mm clear between the outer structure surfaces and the face of the excavation or support members] [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 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 Jacking, Boring, and Tunneling

Unless otherwise indicated, excavation shall be by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Contracting Officer, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections.

3.1.2 Stockpiles

Stockpiles of satisfactory [and unsatisfactory] [and wasted 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. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber-tired equipment, excavated satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory 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 unsatisfactory, such material shall be removed and replaced with satisfactory material from approved sources at no additional cost to the Government. Locations of stockpiles of satisfactory materials shall be subject to prior approval of the Contracting Officer.

3.2 BACKFILLING AND COMPACTION

Backfill material shall consist of satisfactory material, select granular material, or initial backfill material as required. Backfill shall be placed in layers not exceeding 150 mm loose thickness for compaction by hand operated machine compactors, and 200 mm loose thickness for other than hand operated machines, unless otherwise specified. Each layer shall be compacted to at least 90 percent maximum density in accordance with ASTM D 1557.

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 Unstable Material

Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 150 mm loose thickness.

3.2.1.3 Bedding and Initial Backfill

Bedding material type and thickness shall be in accordance with pipe manufacturer recommendations. Initial backfill material shall consist of select granular material and 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 Final Backfill

The remainder of the trench shall be filled with satisfactory material and compacted to at least 90 percent maximum density in accordance with ASTM D 1557 except, top 1 meter under under the roadways and maintenance roads shall be compacted to not less than 95% of maximum density per ASTM D 1557.

3.2.2 Backfill for Appurtenances

After the manhole, catch basin, inlet, or similar structure has been constructed [and the concrete has been allowed to cure for 14 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 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.3.1 Gas Distribution

Trenches shall be excavated to a depth that will provide not less than 450 mm of cover in rock excavation and not less than 600 mm of cover in other excavation.

3.3.2 Water Lines

Trenches shall be of a depth to provide a minimum cover of 750 millimeters from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe.

3.3.3 Plastic Marking Tape

Warning tapes shall be installed directly above the pipe, at a depth of [450] millimeters below finished grade unless otherwise shown.

3.4 TESTING

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government.

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

Classification of backfill materials shall be determined in accordance with ASTM D 2487 and the moisture-density relations of soils shall be determined in accordance with ASTM D 1557. A minimum of one soil classification 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. A minimum of one field density test per lift of backfill for every 200 meters of installation shall be performed. One moisture density relationship shall be determined for every 500 cubic meters of material used. Field in-place density shall be determined in accordance with ASTM D 1556 or ASTM D 2167. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at no additional cost to the Government.

3.4.4 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to 600 millimeters above the top of the pipe, 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 900 mm 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 no additional cost to the Government.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 09910

STATION MARKINGS

PART 1 GENERAL

1.1 REFERENCES

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Paint

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 General
3.2 PAINTING
3.2.1 Preparation of Surfaces
3.2.2 Application
3.3 TABULATION OF LOCATION AND TEXT OF MARKINGS
3.3.1 Abbreviations
3.3.2 Tabulation

-- End of Section Table of Contents --

SECTION 09910

STATION MARKINGS

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.

FEDERAL SPECIFICATIONS (FS)

FS TT -P-115	(Rev F) Paint, Traffic, (Highway, White and Yellow)

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Paint

Exterior paint on concrete shall conform to FS TT-P-115, except the color shall be non-fading black.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 General

The intersection of the channel center line and levee control line with the center line of new, relocated, and existing facilities such as bridges and street intersections, pole lines, underground utility crossings, side drains, upstream and downstream limits of permanent work, and other required information shall be marked by painting station numbers and additional identifying data as listed in the tabulation of location of text of markings. All markings shall be painted on concrete walls (channel walls, headwalls, abutments, etc.)

3.2 PAINTING

3.2.1 Preparation of Surfaces

Concrete surfaces shall be thoroughly cleaned of all curing compounds, efflorescence, dirt, oil or other deleterious material by approved methods. The surface preparation shall be accomplished in such manner that paint will satisfactorily adhere to the surface.

3.2.2 Application

Painting shall be done in a neat and workmanlike manner and may be applied by brush, spray, roller or any combination of these methods. Painting of numbers and letters shall be accomplished with stencils and brush or spray application.Color for letters and numbers shall be black. Ail markings on concrete shall be in uniform capital block letters and numbers, 6 inches high, 3 inches wide, and 3/4-inch width of line. Markings on concrete walls shall be horizontal with the bottom of the marking not lower than 2 feet below the topof the wall.

3.3 TABULATION OF LOCATION AND TEXT OF MARKINGS

3.3.1 Abbreviations

The following abbreviations shall be used where applicable.

3.3.2 Tabulation

Location of Marking Wall	Station*	Text of Marking	Location of Marking Wall	Station*	Text of Marking
R	13+44.341	1600	R	25+33.061	5500
R	13+74.821	1700	R	25+63.541	5600
R	14+05.301	1800	R	25+94.021	5700
R	14+35.781	1900	R	26+24.501	5800
R	14+66.261	2000	R	26+54.981	5900
R	14+96.741	2100	R	26+85.461	6000
R	15+27.221	2200	R	27+15.941	6100
R	15+57.701	2300	R	27+46.421	6200
R	15+88.181	2400	R	27+76.901	6300
R	16+18.661	2500	R	28+07.381	6400
R	16+49.141	2600	R	28+37.861	6500
R	16+79.621	2700	R	28+68.341	6600
R	17+10.101	2800	R	28+98.821	6700
R	17+40.581	2900	R	29+29.301	6800
R	17+71.061	3000	R	29+59.781	6900
R	18+01.541	3100	R	29+90.261	7000
R	18+32.021	3200	R	30+20.741	7100
R	18+62.501	3300	R	30+51.221	7200
R	18+92.981	3400	R	30+81.701	7300
R	19+23.461	3500	R	31+12.181	7400
R	19+53.941	3600	R	31+42.661	7500
R	19+84.421	3700	R	31+73.141	7600
R	20+14.901	3800	R	32+03.621	7700
R	20+45.381	3900	R	32+34.101	7800
R	20+75.861	4000	R	32+64.581	7900
R	21+06.341	4100	R	32+95.061	8000
R	21+36.821	4200	R	33+25.541	8100
R	21+67.301	4300	R	33+56.021	8200
R	21+97.781	4400	R	33+86.501	8300
R	22+28.261	4500	R	34+16.981	8400
R	22+58.741	4600	R	34+47.461	8500

R	22+89.221	4700	R	34+77.941	8600
R	23+19.701	4800	R	35+08.421	8700
R	23+50.181	4900	R	35+38.901	8800
R	23+80.661	5000	R	35+69.381	8900
R	24+11.141	5100	R	35+99.861	9000
R	24+41.621	5200	R	36+30.341	9100
R	24+72.101	5300	R	36+60.821	9200
R	25+02.581	5400	R	36+91.301	9300
				R	37+00.000
9328					

R= Right Channel Wall (looking downstream)
* = The actual location of the channel station shall be acurate to the nearest half meter.

-- End of Section -

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02741

BITUMINOUS PAVING FOR ROADS, STREETS AND OPEN STORAGE AREAS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 PLANT, EQUIPMENT, MACHINES, AND TOOLS
1.3.1 General
1.3.2 Mixing Plants
1.3.3 Straightedge
1.4 WEATHER LIMITATIONS
1.5 PROTECTION OF PAVEMENT
1.6 GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS
1.6.1 Plan Grade
1.6.2 Surface Smoothness
1.7 GRADE CONTROL
1.8 SAMPLING AND TESTING
1.8.1 Aggregates
1.8.1.1 General
1.8.1.2 Sources
1.8.2 Bituminous Materials
1.8.3 Bituminous Mixtures
1.9 DELIVERY, STORAGE, AND HANDLING OF MATERIALS
1.9.1 Mineral Aggregates
1.9.2 Bituminous Materials
1.10 ACCESS TO PLANT AND EQUIPMENT
1.11 WAYBILLS AND DELIVERY TICKETS

PART 2 PRODUCTS

2.1 BITUMINOUS HOT MIX
2.1.1 Aggregates
2.1.1.1 Coarse Aggregate
2.1.1.2 Fine Aggregate
2.1.1.3 Mineral Filler
2.1.2 Bituminous Material
2.1.3 Additives
2.2 PROPORTIONING OF MIXTURE
2.2.1 Job Mix Formula
2.2.2 Test Properties of Bituminous Mixtures
2.2.2.1 Stability, Flow, and Voids
2.2.2.2 Stability

PART 3 EXECUTION

3.1 BASE COURSE CONDITIONING
3.2 PREPARATION OF BITUMINOUS MIXTURES
3.3 WATER CONTENT OF AGGREGATES
3.4 STORAGE OF BITUMINOUS PAVING MIXTURE
3.5 TRANSPORTATION OF BITUMINOUS MIXTURE
3.6 SURFACE PREPARATION OF UNDERLYING COURSE
3.7 PRIME COATING
3.8 TACK COATING
3.9 PLACING
3.9.1 Offsetting Joints
3.9.2 General Requirements for Use of Mechanical Spreader
3.9.3 Placing Strips Succeeding Initial Strips
3.9.4 Handspreading in Lieu of Machine Spreading
3.10 COMPACTION OF MIXTURE
3.10.1 Correcting Deficient Areas
3.11 JOINTS
3.11.1 General
3.11.2 Transverse Joints
3.12 QUALITY CONTROL
3.12.1 General
3.12.2 Inspection Details and Frequency of Testing
3.12.2.1 Aggregate Gradation
3.12.2.2 Aggregate Moisture Content
3.12.2.3 Asphalt Properties
3.12.2.4 Asphalt Content
3.12.2.5 Temperature
3.12.2.6 Density
3.12.2.7 Thickness
3.12.3 Action Required
3.12.3.1 Aggregate Gradation
3.12.3.2 Aggregate Moisture Content
3.12.3.3 Asphalt Properties
3.12.3.4 Asphalt Content
3.12.3.5 Temperature
3.12.3.6 Density
3.12.3.7 Thickness
3.12.4 Reports

-- End of Section Table of Contents --

SECTION 02741

BITUMINOUS PAVING FOR ROADS, STREETS AND OPEN STORAGE AREAS

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 OFFICIAL (AASHTO)

AASHTO MP1	Standard Specification for Performance Graded Asphalt Binder

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 117	(1995) Materials Finer than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 127	(1988; R 1993) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 128	(1993) 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 C 150	(1995a) Portland Cement
ASTM C 183	(1995a) Sampling and the Amount of Testing of Hydraulic Cement
ASTM D 5	(1995) Penetration of Bituminous Materials
ASTM D 75	(1987; R 1992) Sampling Aggregates
ASTM D 140	(1993) Sampling Bituminous Materials
ASTM D 422	(1963; R 1990) Particle-Size Analysis of

	Soils
ASTM D 1559	(1989) Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus
ASTM D 1856	(1995a) Recovery of Asphalt from Solution by Abson Method
ASTM D 2041	(1995) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2172	(1995) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2216	(1992) Laboratory Determination of Water (Moisture) Content of Soil and Rock
ASTM D 3381	(1992) Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D 3515	(1996) Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
ASTM D 4318	(1995) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION MATERIALS TESTING DIVISION (NDOT)

NDOT T 230C	(Rev C) Method of Test for Determining the Percent of Fractured Faces

1.2 SUBMITTALS

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

SD-09 Reports

Asphaltic Cement; GA.

Copies of test results.

Gradation and Physical Properties of Aggregates; GA.

Copies of test results.

Bituminous Pavement Mix Design; GA.

Copy of mix design selected. Report to be submitted and signed by a Civil Engineer licensed to practice in State of Nevada.

Properties of Bituminous Pavement Mixture; GA.

Copies of test results. Report to be submitted and signed by a Civil Engineer licensed to practice in State of Nevada.

Report of Density, Asphalt Content, and Gradation; GA.

Copies of test results. Report to be submitted and signed by a Civil Engineer licensed to practice in State of Nevada.

Report of Grade Conformance and Surface Smoothness; GA.

Copies of test results. Report to be submitted and signed by a Civil Engineer licensed to practice in State of Nevada.

SD-18 Records

Waybills and Delivery Tickets; GA.

Waybills and delivery tickets, during progress of the work.

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 condition 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 metric tons per hour. Drum mixers shall be prequalified at the production rate to be used during actual mix production. The prequalification tests will include extraction and recovery of the asphalt cement in accordance with ASTM D 2172 and ASTM D 1856. The penetration of the recovered asphalt binder shall not be less than 60 percent of the original penetration, as measured in accordance with ASTM D 5.

1.3.3 Straightedge

The Contractor shall furnish and maintain at the site, in good condition, one 3.66 m straightedge for each bituminous paver. Straightedge shall be made available for Government use. 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 temperature of the surface of the existing pavement or base course is below 5 degrees C.

1.5 PROTECTION OF PAVEMENT

After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until the pavement has cooled to 60 degrees C.

1.6 GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS

Finished surface of bituminous courses, when tested as specified below, shall conform to gradeline and elevations shown and to surface-smoothness requirements specified.

1.6.1 Plan Grade

The grade of the completed surface shall not deviate more than 15 mm from the plan grade.

1.6.2 Surface Smoothness

When a 3.66 m 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 6.5 mm from the straightedge.

1.7 GRADE CONTROL

Lines and grades shall be established and maintained by means of line and grade stakes placed at site of work in accordance with the Special Contract Requirements. Elevations of bench marks used by the Contractor for controlling pavement operations at the site of work will 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 bench mark elevations furnished by the Contracting Officer.

1.8 SAMPLING AND TESTING

1.8.1 Aggregates

1.8.1.1 General

Samples of aggregates shall be furnished by the Contractor for approval of aggregate sources and stockpiles prior to the start of production and at times during production of the bituminous mixtures. Times and points of sampling will be designated by the Contracting Officer. Samples will be the basis of approval of specific sources or stockpiles of aggregates for aggregate requirements. Unless otherwise directed, ASTM D 75 shall be used

in sampling coarse and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. All tests necessary to determine compliance with requirements specified herein will be performed by the Contractor.

1.8.1.2 Sources

Sources of aggregates shall be selected well in advance of the time the materials are required in the work. If a previously developed source is selected, evidence shall be submitted 15 days before starting production, indicating that the central-plant hot-mix bituminous pavements constructed with the aggregates have had a satisfactory service record of at least five years under similar climatic and traffic conditions. The Contractor will make such tests and other investigations as necessary to determine whether aggregates meeting requirements specified herein can be produced from proposed sources. If a sample of material from a new source fails to meet specification requirements, the material represented by the sample shall be replaced, and the Contractor will be required to submit new test data on the submitted materials. Approval of the source of aggregate does not relieve the Contractor of responsibility for delivery at the jobsite of aggregates that meet the requirements specified herein.

1.8.2 Bituminous Materials

Bituminous materials shall be sampled in accordance with ASTM D 140. Tests necessary to determine conformance with requirements specified herein will be performed by the Contractor. Sources where bituminous materials are obtained shall be selected in advance of the time when materials will be required in the work. In addition to initial qualification testing of bituminous materials, samples shall be taken before and during construction when shipments of bituminous materials are received or when necessary to assure some condition of handling or storage has not been detrimental to the bituminous material.

1.8.3 Bituminous Mixtures

Sampling and testing of bituminous mixtures will be performed by the Contractor.

1.9 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1.9.1 Mineral Aggregates

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. Mineral filler shall be delivered, stored, and introduced into the mixing plant in a manner to preclude exposure to moisture or other detrimental conditions.

1.9.2 Bituminous Materials

Bituminous 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 shall be maintained below 150 degrees C.

1.10 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.

1.11 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.

PART 2 PRODUCTS

2.1 BITUMINOUS HOT MIX

Bituminous hot mix shall consist of coarse aggregate, fine aggregate, mineral filler, bituminous material, and approved additives, if required, of the qualities and in the proportions specified and shall conform to the requirements contained in paragraph PROPORTIONING OF MIXTURE.

2.1.1 Aggregates

Aggregates shall consist of stone, crushed stone, crushed gravel, screening, sand, and mineral filler, as required. The portion of materials retained on the 4.75 mm sieve shall be known as coarse aggregate, the portion passing the 4.75 mm sieve and retained on the 0.075 millimeter sieve as fine aggregate, and the portion passing the 0.075 millimeter sieve as mineral filler. Aggregate gradation as determined by ASTM C 117 and ASTM C 136 shall conform to the following (General paving would generally consists of maintenance roads or similar structures and arterial street paving would be high volume traffic roads):

Sieve Size	**Bike Path/ Maintenance Road % Passing (by weight)**	**General Paving % Passing (by weight)**	**Arterial Street Paving % Passing (by weight)**
25 mm	**--**	**100**	**100**
19 mm	**--**	**90-100**	**84-97**
12.5 mm	**100**	**78-94**	**66-82**
9.5 mm	**90-100**	**68-84**	**56-72**
4.75 mm	**55-85**	**50-65**	**35-50**
2.36 mm	**32-67**	**30-49**	**23-28**
0.30 mm	**7-27**	**7-25**	**5-19**

0.075 mm	**2-10**	**2-9**	**2-7**

2.1.1.1 Coarse Aggregate

Coarse aggregate shall consist of clean, sound, durable particles meeting the following requirements.

a. Portion of the material larger than 9.5 mm screen shall contain at least 50 percent of particles for general paving and at least 75 percent of particles for arterial street paving having fractured faces when determined in accordance with NDOT T 230C.

b. Percentage of loss shall not exceed 45 after 500 revolutions,as determined in accordance with ASTM C 131.

2.1.1.2 Fine Aggregate

Fine aggregate shall have a plasticity index of 6 percent or less and liquid limit of 35 percent or less when tested in accordance with ASTM D 4318.

2.1.1.3 Mineral Filler

Mineral filler shall consist of portland cement conforming to ASTM C 150 or shall be mechanically reduced rock with the following gradation:

Grain size in mm	**Percent Finer**
0.75	**75-100**
0.05	**65-100**
0.02	**35-65**
0.01	**26-35**
0.005	**10-22**

Grain size shall be determined in accordance with ASTM D 422.

2.1.2 Bituminous Material

Asphalt cement for use in general paving and arterial street paving shall conform to ASTM D 3381, Table 2, Grade AC-40. Asphalt cement for bikepath paving shall confom to PG 70-16, in accordance with AASHTO MP1.

2.1.3 Additives

The use of additives such as antistripping and antifoaming agents is subject to approval.

2.2 PROPORTIONING OF MIXTURE

2.2.1 Job Mix Formula

The JMF for the bituminous mixture will be prepared by the Contractor and approved by the Contracting Officer. The formula will indicate the

percentage of each stockpile and mineral filler, the percentage of each size aggregate, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. Tolerances are given in TABLE I for asphalt content, temperature, and aggregate grading for tests conducted on the mix as discharged from the mixing plant. Bituminous mix that deviates more than 14 degrees C from the JMF shall be rejected. The JMF may be adjusted during construction to improve paving mixtures. Adjustments to the JMF are subject to the approval of the Contracting Officer.

TABLE I. JOB-MIX TOLERANCES

Material	Tolerance, Plus or Minus
Aggregate passing 4.75 mm sieve or larger	5 percent
Aggregate passing 2.36, 1.18, 0.6 and 0.3 mm sieves	4 percent
Aggregate passing 0.15 and 0.075 mm sieves	2 percent
Bitumen	0.25 percent
Temperature of mixing	14 degrees C

2.2.2 Test Properties of Bituminous Mixtures

Finished mixture shall meet requirements described below when tested in accordance with ASTM D 1559. All samples will be compacted with 50 blows of specified hammer on each side of sample. When bituminous mixture fails to meet the requirements specified below, the paving operation shall be stopped until the cause of noncompliance is determined and corrected.

2.2.2.1 Stability, Flow, and Voids

Requirements for stability, flow, and voids are shown in TABLES II and III for nonabsorptive and absorptive aggregates, respectively.

TABLE II. NONABSORPTIVE-AGGREGATE MI

	Wearing Course	Intermediate Course
Stability minimum, newtons	2200	2200
Flow maximum, 25/100-millimeter units	20	20
Voids total mix, percent (1)	3-5	4-6
Voids filled with bitumen, percent (2)	75-85	65-75

(1) The Contracting Officer may permit deviations from limits specified when gyratory method of design is used to develop the JMF.

(2) The Contracting Officer may permit deviation from limits specified for voids filled with bitumen in the intermediate course in order to stay within limits for percent voids total mix.

TABLE III. ABSORPTIVE-AGGREGATE MIXTURE

	Wearing Course	Intermediate Course
Stability minimum, newtons	2200	2200
Flow maximum, 25/100-millimeter units	20	20
Voids total mix, percent (1)	2-4	3-5
Voids filled with bitumen, percent (2)	80-90	70-80

(1) The Contracting Officer may permit deviations from limits specified when gyratory method of design is used to develop the JMF.

(2) The Contracting Officer may permit deviation from limits specified for voids filled with bitumen in the intermediate course in order to stay within limits for percent voids total mix.

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 will be used in computing voids total mix and voids filled with bitumen, and the mixture shall meet requirements in TABLE II.

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 the bulk-impregnated specific gravity method contained in ASTM D 2041 shall be used in computing percentages of voids total mix and voids filled with bitumen; the mixture shall meet requirements in TABLE III.

2.2.2.2 Stability

The index of retained stability must be greater than 75 percent as determined by ASTM D 1559. 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.

PART 3 EXECUTION

3.1 BASE COURSE CONDITIONING

The surface of the base course will be inspected for adequate compaction and surface tolerances specified in paragraph GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS. Unsatisfactory areas shall be corrected.

3.2 PREPARATION OF BITUMINOUS MIXTURES

Rates of feed of aggregates shall be regulated so that the moisture content and temperature of aggregates will be within specified tolerances. Aggregates, mineral filler, and bitumen shall be conveyed into the mixer in proportionate quantities required to meet the JMF. Mixing time shall be as required to obtain a uniform coating of the aggregate with the bituminous material. Temperature of bitumen at time of mixing shall not exceed 150 degrees C. Temperature of aggregate and mineral filler in the mixer shall not exceed 160 degrees C when bitumen is added. Overheated and carbonized mixtures or mixtures that foam shall not be used.

3.3 WATER CONTENT OF AGGREGATES

Drying operations shall reduce the water content of mixture to less than 0.75 percent. The water content test will be conducted in accordance with ASTM D 2216; the weight of the sample shall be at least 500 grams. If the water content is determined on hot bin samples, the water content will be a weighted average based on composition of blend.

3.4 STORAGE OF BITUMINOUS PAVING MIXTURE

Storage shall conform to the applicable requirements of ASTM D 3515; however, in no case shall the mixture be stored for more than 4 hours.

3.5 TRANSPORTATION OF BITUMINOUS MIXTURE

Transportation from paving plant to site shall be in trucks having tight, clean, smooth beds lightly coated with an approved releasing agent to prevent adhesion of the mixture to the truck bodies. Excessive releasing agent shall be drained prior to loading. Each load shall be covered with canvas or other approved material of ample size to protect mixture from weather and to prevent loss of heat. Loads that have crusts of cold, unworkable material or that have become wet will be rejected. Hauling over freshly placed material will not be permitted.

3.6 SURFACE PREPARATION OF UNDERLYING COURSE

Prior to placing of asphaltic pavement, the underlying course shall be cleaned of all foreign or objectionable matter with power brooms and hand brooms.

3.7 PRIME COATING

Surfaces of previously constructed base course shall be sprayed with a coat of bituminous material conforming to Section 02748 BITUMINOUS TACK AND PRIME COATS.

3.8 TACK COATING

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous material conforming to Section 02748 BITUMINOUS TACK AND PRIME COATS.

3.9 PLACING

Bituminous courses shall be constructed only when the base course or existing pavement has no free water on the surface. Bituminous mixtures shall not be placed without ample time to complete spreading and rolling during daylight hours, unless approved satisfactory artificial lighting is provided.

3.9.1 Offsetting Joints

The wearing course shall be placed so that transverse joints in the wearing course shall be offset by at least 600 mm from transverse joints in the underlying course.

3.9.2 General Requirements for Use of Mechanical Spreader

Range of temperatures of mixtures, when dumped into the mechanical spreader, shall be as determined by the Contracting Officer. Mixtures having temperatures less than 110 degrees C when dumped into the mechanical spreader shall not be used. The mechanical spreader shall be adjusted and the speed regulated so that the surface of the course being laid will be smooth and continuous without tears and pulls, and of such depth that, when compacted, the surface will conform to the cross section indicated. Placing with respect to high side with one-way slope shall be as directed. Placing of the mixture shall be as nearly continuous as possible, and speed of placing shall be adjusted, as directed, to permit proper rolling. When segregation occurs in the mixture during placing, the spreading operation shall be suspended until the cause is determined and corrected.

3.9.3 Placing Strips Succeeding Initial Strips

In placing each succeeding strip after initial strip has been spread and compacted as specified below, the screed of the mechanical spreader shall overlap the previously placed strip 50 to 75 mm and be sufficiently high so that compaction produces a smooth dense joint. Mixture placed on the edge of a previously placed strip by the mechanical spreader shall be pushed back to the edge of the strip by use of a lute. Excess mixture shall be removed and wasted.

3.9.4 Handspreading in Lieu of Machine Spreading

In areas where the use of machine spreading is impractical, the mixture shall be spread by hand. Spreading shall be in a manner to prevent segregation. The mixture shall be spread uniformly with hot rakes in a loose layer of thickness that, when compacted, will conform to required grade, density, and thickness.

3.10 COMPACTION OF MIXTURE

Rolling shall begin as soon after placing as the mixture will bear a roller without undue displacement. Delays in rolling freshly spread mixture will not be permitted. After initial rolling, preliminary tests of grade and smoothness shall be made by the Contractor. Deficiencies shall be

corrected so that the finished course will conform to requirements for grade and smoothness specified herein. Grade and smoothness will be checked in each section of completed pavement by the Contracting Officer for compliance. After the Contractor is assured of meeting grade and smoothness requirements, rolling shall be continued until all roller marks are eliminated and at least 95 percent of the density of a laboratory-compacted specimen of the same mixture has been obtained. Places inaccessible to rollers shall be thoroughly compacted with hot hand tampers.

3.10.1 Correcting Deficient Areas

Mixtures that become contaminated or are defective shall be removed to the full thickness of the course. Edges of the area to be removed shall be cut so that sides are perpendicular and parallel to the direction of traffic and so that the edges are vertical. Edges shall be sprayed with bituminous materials conforming to Section 02748 BITUMINOUS TACK AND PRIME COATS. Fresh paving mixture shall be placed in the excavated areas in sufficient quantity so that the finished surface will conform to grade and smoothness requirements. Paving mixture shall be compacted to the density specified herein. Skin patching of an area that has been rolled shall not be permitted.

3.11 JOINTS

3.11.1 General

Joints between old and new pavements, between successive work days, or joints that have become cold (less than 80 degrees C) 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. 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 Section 02748 BITUMINOUS TACK AND PRIME COATS. 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.

3.11.2 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, the edge of previously placed pavement shall be cut back to expose an even vertical surface for 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.

3.12 QUALITY CONTROL

3.12.1 General

Quality Control Testing shall be the responsibility of the Contractor. Testing shall be performed by an acceptable commercial testing laboratory or by the Contractor on approval of the Contracting Officer. Materials shall be tested to establish compliance with the specified requirements. Samples of Bituminous material, unless otherwise specified, shall be in accordance with ASTM D 140. Certificates of compliance shall be furnished. All core holes from which specimens are taken will be patched by the contractor with fresh bituminous mixture, conforming to the specified JMF.

3.12.2 Inspection Details and Frequency of Testing

In addition to other tests specified elsewhere, the Contractor shall perform the following tests on materials as specified hereinafter. At least one set of tests, as described below, shall be completed for each days placement of asphalt.

3.12.2.1 Aggregate Gradation

A test for aggregate gradation for each 500 metric tons of aggregate produced.

3.12.2.2 Aggregate Moisture Content

A test of aggregate moisture content for each day's production.

3.12.2.3 Asphalt Properties

One determination each for stability, flow, voids total mix, and voids filled with bitumen for every 1000 metric tons of asphaltic concrete produced.

3.12.2.4 Asphalt Content

One determination of actual asphalt content per 1000 metric tons of asphaltic concrete produced.

3.12.2.5 Temperature

At least one measurement of asphaltic concrete temperature each hour, in which paving operations are being conducted. Additional tests may be taken as required by the Contracting Officer.

3.12.2.6 Density

At least three cores will be recovered and tested for every 1,000 square meter of pavement, or one day's production, whichever is smaller. Additional tests may be taken as required by the Contracting Officer.

3.12.2.7 Thickness

At least three cores will be recovered and tested for every 1,000 square meter of pavement, or one day's production, whichever is smaller.

Additional tests may be taken as required by the Contracting Officer.

3.12.3 Action Required

3.12.3.1 Aggregate Gradation

When the amount passing any sieve is outside the specification limits, the aggregate shall be immediately resampled and retested. If there is another failure on any sieve, the fact shall immediately be reported to the Contracting Officer, and immediate steps shall be taken to rectify the situation.

3.12.3.2 Aggregate Moisture Content

When the moisture content of the aggregates is outside specification requirements the aggregates shall be immediately resampled and retested. If there is another failure, the fact shall immediately be reported to the Contracting Officer, and immediate steps shall be taken to rectify the situation.

3.12.3.3 Asphalt Properties

If there is a failure in any of the asphalt properties production will cease and the Contracting Officer will be immediately notified. No additional paving will occur until adjustments to the plant and test results confirm that the specified properties are being achieved.

3.12.3.4 Asphalt Content

If there is a failure to meet the specified asphalt content production will cease and the Contracting Officer will be immediately notified. No additional paving will occur until adjustments to the plant and test results confirm that the specified asphalt is being supplied.

3.12.3.5 Temperature

When the temperature of the bituminous mixture is outside specification requirements the mixture shall be immediately resampled and retested. If there is another failure, the fact shall immediately be reported to the Contracting Officer, and immediate steps shall be taken to rectify the situation. In no case will overheated or carbonized mixtures be allowed.

3.12.3.6 Density

When test results indicate lack of compaction additional specimens will be obtained as directed by the Contracting Officer. Based on the test results the Contractor will remove and replace the affected areas of pavement.

3.12.3.7 Thickness

When test results indicate that the finished pavement is 6 mm less than the thickness shown on the drawings, additional samples will be taken to determine the extent of defective thickness. The area determined will be removed and replaced or may be overlaid. The overlay will be a minimum of

1 inch thick and will be placed to duplicate slopes and drainages of the original pavement. No skin patching will be allowed.

3.12.4 Reports

All results of tests conducted at the project site shall be reported as required. During periods requiring protection from weather, reports of pertinent temperatures or other relevant values 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.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02821

FENCING, CHAIN-LINK

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS

PART 2 PRODUCTS

2.1 FENCE FABRIC
2.1.1 Chain Link Fence Fabric
2.1.2 Woven Wire and Wire Netting
2.2 GATES
2.3 POSTS
2.3.1 Metal Posts for Chain Link Fence
2.4 BRACES AND RAILS
2.5 WIRE
2.5.1 Tension Wire
2.6 ACCESSORIES
2.7 CONCRETE
2.8 PADLOCKS
2.9 GROUND RODS

PART 3 EXECUTION

3.1 INSTALLATION
3.2 EXCAVATION
3.3 POST INSTALLATION
3.3.1 Posts for Chain Link Fence
3.4 RAILS
3.4.1 Top Rail
3.4.2 Bottom Rail
3.5 BRACES AND TRUSS RODS
3.6 TENSION WIRES
3.7 CHAIN LINK FABRIC
3.8 GATE INSTALLATION
3.9 GROUNDING

-- End of Section Table of Contents --

SECTION 02821

FENCING, CHAIN-LINK

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 116	(1995) Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric
ASTM A 153/A 153M	(1998) Zinc-Coated (Hot Dip) on Iron and Steel Hardware
ASTM A 392	(1996) Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 491	(1996) Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A 702	(1989; R 1994) Steel Fence Posts and Assemblies, Hot Wrought
ASTM A 780	(1993a) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
ASTM A 824	(1995) Metallic-Coated Steel Marcelled Tension Wire for Use With Chain Link Fence
ASTM C 94	(1998) Ready-Mixed Concrete
ASTM F 626	(1996) Fence Fittings
ASTM F 883	(1997) Padlocks
ASTM F 900	(1994) Industrial and Commercial Swing Gates
ASTM F 1043	(1998a) Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework
ASTM F 1083	(1997) Specification for Pipe, Steel,

	Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F 1184	(1994) Industrial and Commercial Horizontal Slide Gates

UNDERWRITERS LABORATORIES (UL)

UL467	(1993; Rev thru Aug 1996) Grounding and Bonding Equipment

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-13 Certificates

Chain Link Fence; GA.

Statement, signed by an official authorized to certify on behalf of the manufacturer, attesting that the chain link fence and component materials meet the specified requirements.

PART 2 PRODUCTS

2.1 FENCE FABRIC

Fence fabric shall conform to the following:

2.1.1 Chain Link Fence Fabric

ASTM A 392, Class 2, zinc-coated steel wire with minimum coating weight of 610 grams of zinc per square meter of coated surface, or ASTM A 491, Type I, aluminum-coated steel wire. Fabric shall be fabricated of 9 gauge wire woven in 50 mm mesh. Fabric height shall be 1.8 m meters as shown. Fabric shall be twisted and barbed on the top selvage and knuckled on the bottom selvage.

2.1.2 Woven Wire and Wire Netting

Woven wire shall conform to ASTM A 116 No. 12-1/2 close mesh fence; size as indicated. Wire netting shall conform to ASTM A 116 heavy grade; size as indicated.

2.2 GATES

ASTM F 900 and/or ASTM F 1184. Gate shall be the type and swing shown. Gate frames shall conform to strength and coating requirements of ASTM F 1083 for Group IA, steel pipe, with external coating Type A, nominal pipe size (NPS) 1-1/2. Gate frames shall conform to strength and coating requirements of ASTM F 1043, for Group IC, steel pipe with external coating

Type A or Type B, nominal pipe size (NPS) 1-1/2. Gate fabric shall be as specified for chain link fabric. Gate leaves more than 2.44 m wide shall have either intermediate members and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist. Gate leaves less than 2.44 m wide shall have truss rods or intermediate braces. Gate fabric shall be attached to the gate frame by method standard with the manufacturer except that welding will not be permitted. Latches, hinges, stops, keepers, rollers, and other hardware items shall be furnished as required for the operation of the gate. Latches shall be arranged for padlocking so that the padlock will be accessible from both sides of the gate. Stops shall be provided for holding the gates in the open position.

2.3 POSTS

2.3.1 Metal Posts for Chain Link Fence

ASTM F 1083, zinc-coated. Group IA, with external coating Type A steel pipe. Group IC steel pipe, zinc-coated with external coating Type A or Type B and Group II , formed steel sections, shall meet the strength and coating requirements of ASTM F 1043. Group III, ASTM F 1043 steel H-section may be used for line posts in lieu of line post shapes specified for the other classes. Sizes shall be as shown on the drawings. Line posts and terminal (corner, gate, and pull) posts selected shall be of the same designation throughout the fence. Gate post shall be for the gate type specified subject to the limitation specified in ASTM F 900 and/or ASTM F 1184.

2.4 BRACES AND RAILS

ASTM F 1083, zinc-coated, Group IA, steel pipe, size NPS 1-1/4. Group IC steel pipe, zinc-coated, shall meet the strength and coating requirements of ASTM F 1043. Group II , formed steel sections, size 42 mm (1-21/32 inch), conforming to ASTM F 1043, may be used as braces and rails if Group II line posts are furnished.

2.5 WIRE

2.5.1 Tension Wire

Tension wire shall be Type I or Type II, Class 2 coating, in accordance with ASTM A 824.

2.6 ACCESSORIES

ASTM F 626. Ferrous accessories shall be zinc or aluminum coated. Truss rods shall be furnished for each terminal post. Truss rods shall be provided with turnbuckles or other equivalent provisions for adjustment. Tie wire for attaching fabric to rails, braces, and posts shall be 9 gauge steel wire and match the coating of the fence fabric. Miscellaneous hardware coatings shall conform to ASTM A 153/A 153M unless modified.

2.7 CONCRETE

ASTM C 94, using 19 mm maximum size aggregate, and having minimum compressive strength of 21 MPa at 28 days. Grout shall consist of one part portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

2.8 PADLOCKS

Padlocks shall be a combination commercial type padlock similiar to Master #175 or equivalent.

2.9 GROUND RODS

Rods made of copper-clad steel shall conform to UL 467. Ground rods shall be not less than 19.1 mm (3/4 inch) in diameter and 3.048 m (10 feet) in length.

PART 3 EXECUTION

3.1 INSTALLATION

Fence shall be installed to the lines and grades indicated. The area on either side of the fence line shall be cleared to the extent indicated. Line posts shall be spaced equidistant at intervals not exceeding 3 m (10 feet). Terminal (corner, gate, and pull) posts shall be set at abrupt changes in vertical and horizontal alignment. Fabric shall be continuous between terminal posts; however, runs between terminal posts shall not exceed 152.4 m (500 feet). Any damage to galvanized surfaces, including welding, shall be repaired with paint containing zinc dust in accordance with ASTM A 780.

3.2 EXCAVATION

Post holes shall be cleared of loose material. Waste material shall be spread where directed. The ground surface irregularities along the fence line shall be eliminated to the extent necessary to maintain a 50 mm clearance between the bottom of the fabric and finish grade.

3.3 POST INSTALLATION

3.3.1 Posts for Chain Link Fence

Posts shall be set plumb and in alignment. Except where solid rock is encountered, posts shall be set in concrete to the depth indicated on the drawings. Where solid rock is encountered with no overburden, posts shall be set to a minimum depth of 457 mm (18 inches) in rock. Where solid rock is covered with an overburden of soil or loose rock, posts shall be set to the minimum depth indicated on the drawing unless a penetration of 457 mm (18 inches) in solid rock is achieved before reaching the indicated depth, in which case depth of penetration shall terminate. All portions of posts set in rock shall be grouted. Portions of posts not set in rock shall be set in concrete from the rock to ground level. Posts set in concrete shall be set in holes not less than the diameter shown on the drawings. Diameters of holes in solid rock shall be at least 25 mm (1 inch) greater than the largest cross section of the post. Concrete and grout shall be

thoroughly consolidated around each post, shall be free of voids and finished to form a dome. Concrete and grout shall be allowed to cure for 72 hours prior to attachment of any item to the posts.

3.4 RAILS

3.4.1 Top Rail

Top rail shall be supported at each post to form a continuous brace between terminal posts. Where required, sections of top rail shall be joined using sleeves or couplings that will allow expansion or contraction of the rail.

3.4.2 Bottom Rail

The bottom rail shall be bolted to double rail ends and double rail ends shall be securely fastened to the posts. Bolts shall be peened to prevent easy removal. Bottom rail shall be installed before chain link fabric.

3.5 BRACES AND TRUSS RODS

Braces and truss rods shall be installed as indicated and in conformance with the standard practice for the fence furnished. Horizontal (compression) braces and diagonal truss (tension) rods shall be installed on fences over 1.83 m (6 feet) in height. A center brace or 2 diagonal truss rods shall be installed on 3.66 m (12 foot) fences. Braces and truss rods shall extend from terminal posts to line posts. Diagonal braces shall form an angle of approximately 40 to 50 degrees with the horizontal. No bracing is required on fences 1.83 m (6 feet) high or less if a top rail is installed.

3.6 TENSION WIRES

Tension wires shall be installed along the top and bottom of the fence line and attached to the terminal posts of each stretch of the fence. Top tension wires shall be installed within the top 305 mm of the installed fabric. Bottom tension wire shall be installed within the bottom 152 mm (6 inches) of the installed fabric. Tension wire shall be pulled taut and shall be free of sag.

3.7 CHAIN LINK FABRIC

Chain link fabric shall be installed on the side of the post indicated. Fabric shall be attached to terminal posts with stretcher bars and tension bands. Bands shall be spaced at approximately 381 mm (15 inch) intervals. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Fabric shall be fastened to line posts at approximately 381 mm (15 inch) intervals and fastened to all rails and tension wires at approximately 610 mm intervals. Fabric shall be cut by untwisting and removing pickets. Splicing shall be accomplished by weaving a single picket into the ends of the rolls to be joined. The bottom of the installed fabric shall be 50 mm plus or minus 13 mm above the ground.

3.8 GATE INSTALLATION

Gates shall be installed at the locations shown. Hinged gates shall be mounted to swing as indicated. Latches, stops, and keepers shall be installed as required. Padlocks shall be attached to gates or gate posts with chains. Hinge pins, and hardware shall be welded or otherwise secured to prevent removal.

3.9 GROUNDING

Except as indicated below, metal fences that are electrically continuous with metal posts extending at least 600 mm into the ground require no additional grounding. Other fences shall be grounded on each side of every gate. Fences shall be grounded by means of ground rods every 300 to 450 m of length when fences are located in isolated places, and every 150 to 225 m when in proximity (30 m or less) to public roads, highways, and buildings. The connection to ground shall be made from the post where it is of metal and is electricallsy continuous with the fencing.

Metal fences and metal hand rail system (pipe safety railing) crossed by overhead powerlines in excess of 600 volts shall be grounded. Fences and metal hand rail system crossed by powerlines of 600 volts or more shall be grounded at or near the point of crossing and at distances not exceeding 45 m on each side of crossing. Ground conductor shall consist of No. 8 AWG solid copper wire. Grounding electrodes shall be 19 mm (3/4 inch) by 3.05 m (10 foot) long copper-clad steel rod. Electrodes shall be driven into the earth so that the top of the electrode is at least 152 mm (6 inches) below the grade. Where driving is impracticable, electrodes shall be buried a minimum of 305 mm deep and radially from the fence. The top of the electrode shall be not less than 0.6 m or more than 2.4 m from the fence. Ground conductor shall be clamped to the fence or railing and electrodes with bronze grounding clamps to create electrical continuity between fence posts, fence fabric, and ground rods.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 03 - CONCRETE

SECTION 03301

CAST-IN-PLACE STRUCTURAL CONCRETE

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 GOVERNMENT TESTING AND SAMPLING
1.3.1 Preconstruction Sampling and Testing
1.3.1.1 Aggregates
1.3.1.2 Cementitious Materials, Admixtures, and Curing Compound
1.3.2 Construction Testing by the Government
1.3.2.1 Chemical Admixtures Storage
1.3.2.2 Cement and Pozzolan
1.3.2.3 Concrete Strength
1.4 DESIGN REQUIREMENTS
1.4.1 Concrete Strength
1.4.2 Maximum Water-Cement (W/C) Ratio
1.5 CONSTRUCTION TOLERANCES
1.5.1 General
1.5.2 Appearance

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Cementitious Materials
2.1.1.1 Portland Cement
2.1.1.2 High-Early-Strength Portland Cement
2.1.1.3 Pozzolan
2.1.2 Aggregates
2.1.2.1 General
2.1.2.2 Concrete Aggregate Sources
2.1.3 Chemical Admixtures
2.1.3.1 Air-Entraining Admixture
2.1.3.2 Accelerating Admixture
2.1.3.3 Water-Reducing or Retarding Admixture
2.1.4 Curing Materials
2.1.4.1 Impervious-Sheet Curing Materials
2.1.4.2 Membrane-Forming Curing Compound
2.1.5 Water
2.1.6 Non Shrink Grout
2.1.7 Latex Bonding Compound
2.1.8 Epoxy Resin
2.2 CONCRETE MIXTURE PROPORTIONING

2.2.1 Quality of Mixture
2.2.2 Nominal Maximum-Size Coarse Aggregate
2.2.3 Air Content
2.2.4 Slump
2.2.5 Concrete Proportioning
2.2.6 Required Average Compressive Strength
2.2.6.1 Average Compressive Strength from Test Records
2.2.6.2 Average Compressive Strength without Previous Test Records

PART 3 EXECUTION

3.1 EQUIPMENT
3.1.1 Capacity
3.1.2 Batch Plant
3.1.2.1 Batching Equipment
3.1.2.2 Scales
3.1.2.3 Batching Tolerances
3.1.2.4 Moisture Control
3.1.3 Concrete Mixers
3.1.3.1 Stationary Mixers
3.1.3.2 Truck Mixers
3.1.4 Conveying Equipment
3.1.4.1 Buckets
3.1.4.2 Transfer Hoppers
3.1.4.3 Trucks
3.1.4.4 Chutes
3.1.4.5 Belt Conveyors
3.1.4.6 Concrete Pumps
3.1.5 Vibrators
3.2 PREPARATION FOR PLACING
3.2.1 Embedded Items
3.2.2 Concrete on Earth Foundations
3.2.3 Concrete on Rock Foundations
3.2.4 Construction Joint Treatment
3.2.4.1 Joint Preparation
3.2.4.2 Air-Water Cutting
3.2.4.3 High-Pressure Water Jet
3.2.4.4 Wet Sandblasting
3.2.4.5 Waste Disposal
3.3 PLACING
3.3.1 Placing Procedures
3.3.2 Placement by Pump
3.3.3 Time Interval Between Mixing and Placing
3.3.4 Cold-Weather Placing
3.3.5 Hot-Weather Placing
3.3.6 Consolidation
3.4 FINISHING
3.4.1 Unformed Surfaces
3.4.1.1 Float Finish
3.4.1.2 Trowel Finish
3.4.1.3 Broom Finish
3.4.2 Formed Surfaces
3.4.3 Formed Surface Repair
3.4.3.1 Classes A & B Finishes

3.4.3.2 Class D Finish
3.4.3.3 Material and Procedure for Repairs
3.5 CURING AND PROTECTION
3.5.1 Duration
3.5.2 Moist Curing
3.5.3 Membrane-Forming Curing Compound
3.5.3.1 Application
3.5.4 Evaporation Retardant
3.5.5 Cold-Weather Curing and Protection
3.5.6 Nonshrink Grout Application
3.6 TESTS AND INSPECTIONS
3.6.1 General
3.6.2 Testing and Inspection Requirements
3.6.2.1 Fine Aggregate
3.6.2.2 Coarse Aggregate
3.6.2.3 Scales
3.6.2.4 Batch-Plant Control
3.6.2.5 Concrete Mixture
3.6.2.6 Inspection Before Placing
3.6.2.7 Placing
3.6.2.8 Vibrators
3.6.2.9 Curing
3.6.2.10 Cold-Weather Protection and Sealed Insulation Curing
3.6.2.11 Cold-Weather Protection Corrective Action
3.6.2.12 Mixer Uniformity
3.6.2.13 Mixer Uniformity Corrective Action
3.6.3 Reports

-- End of Section Table of Contents --

SECTION 03301

CAST-IN-PLACE STRUCTURAL CONCRETE

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	(1977; R 1989) Evaluation of Strength Test Results of Concrete
ACI 305R	(1991) Hot Weather Concreting
ACI 318M/318RM	(1995) Building Code Requirements for Reinforced Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 31/C 31M	(1996) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1997) Concrete Aggregates
ASTM C 39	(1996) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42	(1994) Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 94	(1997) Ready-Mixed Concrete
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 143	(1990a) Slump of Hydraulic Cement Concrete

ASTM C 150	(1997) Portland Cement
ASTM C 171	(1997) Sheet Materials for Curing Concrete
ASTM C 172	(1997) Sampling Freshly Mixed Concrete
ASTM C 192/C 192M	(1995) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231	(1997) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(1995) Air-Entraining Admixtures for Concrete
ASTM C 309	(1997) Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 494	(1992) Chemical Admixtures for Concrete
ASTM C 566	(1989) Total Moistutre Content of Aggregae by Drying
ASTM C 595	(1995a) Blended Hydraulic Cements
ASTM C 597	(1983; R 1991) Pulse Velocity Through Concrete
ASTM C 618	(1997) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 803	(1990) Penetration Resistance of Hardened Concrete
ASTM C 805	(1994) Rebound Number of Hardened Concrete
ASTM C 881	(1990) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 1059	(1991) Latex Agents for Bonding Fresh to Hardened Concrete
ASTM C 1077	(1997) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 1107	(1997) Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM D 75	(1987; R 1992) Sampling Aggregates

CORPS OF ENGINEERS (COE)

COE CRD-C 94	(1995) Surface Retarders
COE CRD-C 100	(1975) Method of Sampling Concrete Aggregate and Aggregate Sources, and Selection of Material for Testing
COE CRD-C 104	(1980) Method of Calculation of the Fineness Modulus of Aggregate
COE CRD-C 112	(1969) Method of Test for Surface Moisture in aggregate by Water Displacement
COE CRD-C 143	(1962) Meters for Automatic Indication of Moisture in Fine Aggregate
COE CRD-C 318	(1972) Cloth, Burlap, Jute (or Kenaf)
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

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	(1990) Concrete Plant Standards

1.2 SUBMITTALS

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

SD-01 Data

Concrete Mixture Proportions; FIO.

Concrete mixture proportions shall be determined by the Contractor, in accordance with the requirements in paragraph CONCRETE MIXTURE PROPORTIONING, and submitted for review. The concrete mixture quantities of all ingredients per cubic meter and nominal maximum coarse aggregate size that will be used in the manufacture of each quality of concrete shall be started. Proportions shall indicate the mass of cement and pozzolan when used and water; the mass of aggregates in a saturated surface-dry condition; and the quantities of admixtures. The submission shall be

accompanied by test reports from a laboratory complying with ASTM C 1077 which show that proportions thus selected will produce concrete of the qualities indicated. No substitution shall be made in the source or type of materials used in the work without additional tests to show that the quality of the new materials and concrete are satisfactory.

Concrete Mixers; FIO.

The Contractor shall submit concrete mixer data which includes the make, type and capacity of concrete mixers proposed for mixing concrete in conformance with the paragraph CAPACITY and CONCRETE MIXERS.

Conveying Equipment and Methods; FIO.

The conveying equipment and methods for transporting, handling, and depositing the concrete shall be submitted for review by the Contracting Officer for conformance with paragraphs CAPACITY and CONVEYING EQUIPMENT.

SD-08 Statements

Testing Technicians; Concrete Construction Inspector; FIO.

The Contractor shall submit statements that the concrete testing technicians and the concrete inspectors meet the requirements of paragraph TESTS AND INSPECTIONS.

Construction Joint Treatment; GA.

The method and equipment proposed for joint cleanup and waste disposal shall be submitted for review and approval for conformance with paragraph CONSTRUCTION JOINT TREATMENT.

Curing and Protection; GA.

The curing medium and methods to be used shall be submitted for review and approval for conformance with paragraph CURING AND PROTECTION.

Cold-Weather Placing; GA.

If concrete is to be placed under cold-weather conditions, the proposed materials and methods, and protection meeting the requirements of paragraph COLD-WEATHER PLACING shall be submitted for review and approval.

Hot-Weather Placing; GA.

If concrete is to be placed under hot-weather conditions, the proposed materials and methods, and protections meeting the requirements of paragraph HOT-WEATHER PLACING and FINISHING, shall be submitted for review and approval.

SD-09 Reports

Aggregate Quality; GA.

Aggregate quality tests shall be submitted at least 30 days prior to start of concrete placement, in accordance with paragraph QUALITY OF AGGREGATES.

Uniformity of Concrete Mixing; FIO.

The results of the initial mixer uniformity tests as required in paragraph MIXER UNIFORMITY shall be submitted at least 5 days prior to the initiation of placing.

Tests and Inspections; FIO.

Test results and inspection reports shall be submitted daily and weekly as required in paragraph REPORTS.

SD-13 Certificates

Cementitious Materials; GA.

Cementitious Materials, including Cement and Pozzolan, will be accepted on the basis of the manufacturer's certification of compliance, accompanied by mill test reports that materials meet the requirements of the specification under which they are furnished. Certification and mill test reports shall be from samples taken from the particular lot furnished. No cementitious materials shall be used until notice of acceptance has been given by the Contracting Officer. Cementitious materials will be subject to check testing from samples obtained at the source, at transfer points, or at the project site, as scheduled by the Contracting Officer, and such sampling will be by or under the supervision of the Government at its expense. Material not meeting specifications shall be promptly removed from the site of work.

Other Chemical Admixtures; FIO.

Other Chemical Admixtures shall be certified for compliance with all specification requirements.

Membrane-Forming Curing Compound; FIO.

Membrane-Forming Curing Compound shall be certified for compliance with all specification requirements.

Epoxy Resin; FIO.
Latex Bonding Compound; FIO.

Epoxy Resin and Latex Bonding Compound shall be certified for compliance with all specification requirements.

Nonshrink Grout; FIO.

Descriptive literature of the nonshrink grout proposed for use shall be furnished together with a certificate from the manufacturer stating that it is suitable for the application for which it is being considered.

1.3 GOVERNMENT TESTING AND SAMPLING

The Government will sample and test aggregates and concrete to determine compliance with the specifications. The Contractor shall provide facilities and labor as may be necessary for procurement of representative test samples. Samples of aggregates will be obtained at the point of batching in accordance with ASTM D 75. Concrete will be sampled in accordance with ASTM C 172.

1.3.1 Preconstruction Sampling and Testing

1.3.1.1 Aggregates

The aggregate sources listed in paragraph: Concrete Aggregate Source have been tested and at the time testing was performed were capable of producing materials of a quality required for this project provided suitable processing is performed. The Contractor may furnish materials from a listed source or from a source not listed. Samples from any source of coarse aggregate and any source of fine aggregate selected by the Contractor, consisting of not less than 70 kg of each size coarse aggregate and 35 kg of fine aggregate taken under the supervision of the Contracting Officer in accordance with COE CRD-C 100 shall be delivered to a local materials testing lab selected by the Government within 15 days after notice to proceed. Sampling and shipment of samples shall be at the Contractor's expense. Sixty (60) days will be required to complete evaluation of the aggregates. Testing will be performed by and at the expense of the Government in accordance with the applicable COE CRD-C or ASTM test methods. The cost of testing one source for each size of aggregate will be borne by the Government. If the Contractor selects more than one source for each aggregate size or selects a substitute source for any size aggregate after the original source was tested, the cost of that additional testing will be borne by the Contractor. Tests to which aggregate may be subjected are specific gravity, absorption, L.A. abrasion (500 revolutions), clay lumps and friable particles and any test necessary to demonstrate that the aggregate is of a quality that is at least equivalent to those sources listed herein and meeting the requirements of ASTM C 33. The Government's test data and other information on aggregate quality of those sources listed in paragraph MATERIALS are included in the Design Memorandum and are available for review in the district office. Testing of aggregates by the Government does not relieve the Contractor of the requirements outlined in paragraph TESTS AND INSPECTIONS.

1.3.1.2 Cementitious Materials, Admixtures, and Curing Compound

At least sixty (60) days in advance of concrete placement, the Contractor shall notify the Contracting Officer of the sources for cementitious materials, admixtures, and curing compound, along with sampling location, brand name, type, and quantity to be used in the manufacture and/or curing of the concrete.

1.3.2 Construction Testing by the Government

Sampling and testing will be performed by and at the expense of the Government except as otherwise specified. No material shall be used until notice has been given by the Contracting Officer that test results are

satisfactory.

1.3.2.1 Chemical Admixtures Storage

Chemical admixtures that have been in storage at the project site for longer than 6 months or that have been subjected to freezing shall be retested at the expense of the Contractor when directed by the Contracting Officer and shall be rejected if test results are not satisfactory. Chemical admixtures will be accepted based on compliance with the requirements of paragraph CHEMICAL ADMIXTURES.

1.3.2.2 Cement and Pozzolan

If cement or pozzolan is to be obtained from more than one source, the initial notification shall state the estimated amount to be obtained from each source and the proposed schedule of shipments.

1.3.2.3 Concrete Strength

Compressive strength test specimens will be made by the Government and cured in accordance with ASTM C 31 and tested in accordance with ASTM C 39. 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 3.5 MPa. 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 nondestructive testing, 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.

a. Investigation of Low-Strength Test Results - When any strength test of standard-cured test cylinders falls below the specified strength requirement by more than 3.5 MPa 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. Nondestructive testing in accordance with ASTM C 597, ASTM C 803, or ASTM C 805 may be permitted by the Contracting Officer to estimate the relative strengths at various locations in the structure as an aid in evaluating concrete strength in place or for selecting areas to be cored. Such tests shall not be used as a basis for acceptance or rejection.

b. Testing of Cores - When the strength of concrete in place is considered potentially deficient, cores shall be obtained and tested in accordance with ASTM C 42. 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 performance 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.

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 318M/318RM. Concrete work evaluated by structural analysis or by results of a load test shall be corrected in a manner satisfactory to the Contacting Officer. All investigations, testing, load tests, and correction of deficiencies will be performed and approved by the Contracting Officer at the expense of the Contractor, except that if all concrete is in compliance with the plans and specifications, the cost of investigations, testing, and load tests will be at the expense of the Government.

1.4 DESIGN REQUIREMENTS

1.4.1 Concrete Strength

Specified compressive strength (f'c) shall be as follows:

COMPRESSIVE STRENGTH	STRUCTURE OR PORTION OF STRUCTURE
30 MPa at 28 days	Box culvert and similar types of structure
25 MPa at 28 days	Open Channel and general construction

1.4.2 Maximum Water-Cement (W/C) Ratio

The maximum water-cement ratio shall be 0.45 for all concrete structures. This W/C may cause higher strengths than that required by paragraph CONCRETE STRENGTH

1.5 CONSTRUCTION TOLERANCES

1.5.1 General

The definitions of the terms used in the following tables shall be as defined in ACI 117/117R. Level and grade tolerance measurements of slabs shall be made as soon as possible after finishing. When forms or shoring are used, the measurements shall be made prior to removal. Tolerances are not cumulative. The most restrictive tolerance controls. Tolerances shall not extend the structure beyond legal boundaries. Except as specified otherwise, plus tolerance increases the amount or dimension to which it applies, or raises a level alignment, and minus tolerance decreases the amount or dimension to which it applied, or lowers a level alignment. A tolerance without sign means plus or minus. Where only one signed tolerance is specified, there is no limit in the other direction.

TOLERANCE FOR FINISHED FORMED CONCRETE SURFACES

(1) Vertical alignment

Formed surfaces slope with respect to the specified plane

Vertical alignment of outside corner of exposed corner columns and control joint grooves in concrete exposed to view ..... 7 mm in 3000 mm

All other conditions ..... 10 mm in 3000 mm

(2) Abrupt variation
The offset between concrete surfaces for the following classes of surface:

Class A ..... 3 mm
Class B ..... 6 mm
Class D ..... 25 mm

(3) Gradual variation

Surface finish tolerances as measured by placing a freestanding (unleveled), 1.5 m straightedge for plane surface or curved template for curved surface anywhere on the surface and allowing it to rest upon two high spots within 72 hr after concrete placement. The gap at any point between the straightedge or template and the surface shall not exceed:

Class B ..... 6 mm
Class C ..... 13 mm
Class D ..... 25 mm

TOLERANCES FOR STRUCTURES EXPOSED TO FLOW

(1) Lateral alignment

Alignment of tangents ..... 50 mm
Alignment of curves ..... 100 mm
Width of section at any height ..... 0.0025W + 25 mm

(2) Level alignment

Profile grade ..... 25 mm
Surface of invert ..... 6 mm
Surface of side slope ..... 13 mm
Height of lining ..... 0.005H + 25 mm

(3) Cross-sectional dimensions

Thickness of lining cross section: 10% of specified thickness provided average thickness is maintained as determined by daily batch volumes.

1.5.2 Appearance

Permanently exposed surfaces shall be cleaned, if stained or otherwise discolored, by a method that does not harm the concrete and that is approved by the Contracting Officer.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cementitious Materials

Cementitious materials shall be portland cement, portland-pozzolan cement, or portland cement in combination with pozzolan and shall conform to appropriate specifications listed below.

2.1.1.1 Portland Cement

ASTM C 150, Type V, low alkali.

2.1.1.2 High-Early-Strength Portland Cement

ASTM C 150, Type III, with C3A limited to 8 percent, low alkali. Type III cement shall be used only in isolated instances and only when specifically approved in writing.

2.1.1.3 Pozzolan

Pozzolan shall conform to ASTM C 618, Class F, with the loss on ignition limited to 6 percent and the optional requirements for multiple factor, drying shrinkage, and uniformity from Table 2A.

2.1.2 Aggregates

2.1.2.1 General

Concrete aggregates may be furnished from any source capable of meeting the quality requirements as stated herein below. Fine and coarse aggregates shall conform to the grading requirements of ASTM C 33. The nominal maximum size shall be as listed in paragraph NOMINAL MAXIMUM-SIZE COARSE AGGREGATE.

2.1.2.2 Concrete Aggregate Sources

a. List of Sources - The concrete aggregates source may be selected from the following existing commercial sources:

Nevada Ready Mix.....Lone Mountain Pit
WMK Material (CSR).....Buffalo Road Pit
Bonanza Materials.....Henderson
Lopke Granite.....Henderson

b. Selection of Source - After the award of the contract, the Contractor shall designate in writing only one source or combination of sources from which he proposes to furnish aggregates. If the Contractor proposes to furnish aggregates from a source or from sources not listed above, he may designate only a single source or single combination of sources for aggregates. Regardless of the source, selected samples for acceptance testing shall be provided as required by paragraph GOVERNMENT TESTING AND SAMPLING. If a source for coarse or fine aggregates so designated by the Contractor does not meet the quality requirements stated hereinbefore, the Contractor may not submit for approval other non-listed sources but shall furnish the coarse or fine aggregate, as the case may be, from sources listed above at no additional cost to the Government.

2.1.3 Chemical Admixtures

Chemical admixtures to be used, when required or permitted, shall conform to the appropriate specification listed.

2.1.3.1 Air-Entraining Admixture

The air-entraining admixture shall conform to ASTM C 260 and shall consistently cause the concrete to have an air content in the specified ranges under field conditions.

2.1.3.2 Accelerating Admixture

Accelerators shall meet the requirements of ASTM C 494, Type C or E, except that calcium chloride or admixtures containing calcium chloride shall not be used.

2.1.3.3 Water-Reducing or Retarding Admixture

a. Water-Reducing or Retarding Admixtures: ASTM C 494, Type A, B, or D, except that the 6-month and 1-year compressive strength tests are waived.

b. High-Range Water Reducing Admixture: ASTM C 494, Type F or G except that the 6-month and 1-year strength requirements shall be waived. The admixture may be used only when approved by the Contracting Officer.

2.1.4 Curing Materials

2.1.4.1 Impervious-Sheet Curing Materials

Impervious-sheet curing materials shall conform to ASTM C 171, type optional, except polyethylene film shall not be used.

2.1.4.2 Membrane-Forming Curing Compound

The membrane-forming curing compound shall conform to ASTM C 309, Type 2.

2.1.5 Water

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

2.1.6 Non Shrink Grout

Nonshrink grout shall conform to ASTM C 1107 and shall be a commercial formulation suitable for the application proposed. Grout strength shall be 31 MPa in 3 days.

2.1.7 Latex Bonding Compound

Latex bonding compound agents for bonding fresh to hardened concrete shall conform to ASTM C 1059.

2.1.8 Epoxy Resin

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

2.2 CONCRETE MIXTURE PROPORTIONING

2.2.1 Quality of Mixture

For each portion of the structure, mixture proportions shall be selected so that the strength and W/C requirements listed in paragraph DESIGN REQUIREMENTS are met.

2.2.2 Nominal Maximum-Size Coarse Aggregate

Nominal maximum-size coarse aggregate shall be 37.5 mm except 19.0 mm nominal maximum-size coarse aggregate shall be used when any of the following conditions exist: the narrowest dimension between sides of forms is less than 190 mm, the depth of the slab is less than 114 mm, or the minimum clear spacing between reinforcing is less than 50 mm.

2.2.3 Air Content

Air content as determined by ASTM C 231 shall be between 4 and 6 percent.

2.2.4 Slump

The slump shall be determined in accordance with ASTM C 143 and shall be within the range of 25 mm to 75 mm. Where placement by pump is approved, the slump shall not exceed 150 mm.

2.2.5 Concrete Proportioning

Trial batches and testing requirements for various qualities of concrete specified shall be the responsibility of the Contractor. Samples of aggregates shall be obtained in accordance with the requirements of ASTM D 75. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by the manufacturer's test reports indicating compliance with applicable specified requirements. Trial mixtures having proportions, consistencies, and air content suitable for the work shall be made based on methodology described in ACI 211.1, using at least three different water-cement ratios, which will produce a range of strength encompassing those required for the work. The maximum water-cement ratios required in paragraph MAXIMUM WATER-CEMENT RATIO will be converted to a weight ratio of water to cement plus pozzolan by mass as described in ACI 211.1. Trial mixtures shall be proportioned for maximum permitted slump and air content with due consideration to the approved conveying and placement method. The temperature of concrete in each trial batch shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192. They shall be tested at 7 days and at the design age specified in paragraph DESIGN REQUIREMENTS in accordance with ASTM C 39. From these test results, a curve will be plotted showing the relationship between water-cement ratio and strength.

2.2.6 Required Average Compressive Strength

In meeting the water-cement ratio and strength requirements specified in paragraph CONCRETE STRENGTH, the selected mixture proportion shall produce a required average compressive strength f'cr exceeding the specified strength f'c by the amount indicated below.

2.2.6.1 Average Compressive Strength 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. 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 5 MPa 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 or at another test age designated for determination of f'c.

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:

$$f'cr = f'c + 1.34S$$
$$f'cr = f'c + 2.33S - 3.45$$

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:

MODIFICATION FACTOR

NUMBER OF TESTS*	FOR STANDARD DEVIATION Use tabulation in paragraph DETERMINING REQUIRED AVERAGE STRENGTH
less than 15	
15	1.16
20	1.08
25	1.03
30 or more	1.00

*Interpolate for intermediate numbers of tests.

2.2.6.2 Average Compressive Strength 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:

If the specified compressive strength f'c is 20.7 to 34.5 MPa,

$$f'cr = f'c + 8.27$$

PART 3 EXECUTION

3.1 EQUIPMENT

3.1.1 Capacity

The batching, mixing, conveying, and placing equipment shall have a capacity of at least 76 cubic meters per hour.

3.1.2 Batch Plant

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.

3.1.2.1 Batching Equipment

The batching controls shall be semiautomatic or automatic. The 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 an accurate recorder or recorders that meet the requirements of NRMCA CPMB 100. Separate bins or compartments shall be provided for each size group of aggregate, cement, and pozzolan. Aggregates shall be weighed either in separate weigh batchers with individual scales or cumulatively in one weigh batcher on one scale. Aggregate shall not be weighed in the same batcher with cement or pozzolan. If both cement and pozzolan are used, they may be batched cumulatively provided that the portland cement is batched first. If measured by mass, the mass of the water shall not be weighed cumulatively with another ingredient. Water batcher filling and discharging valves shall be so interlocked that the discharge valve cannot be opened before the filling valve is fully closed. An accurate mechanical device for measuring and dispensing each admixture shall be provided. Each dispenser shall be interlocked with the batching and discharging operation of the water so that each admixture is separately batched and discharged automatically in a manner to obtain uniform distribution throughout the batch in the specified mixing period. Admixtures shall not be combined prior to introduction in water. 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. All filling ports for cementitious materials bins or silos shall be clearly marked with a permanent sign stating the contents.

3.1.2.2 Scales

The equipment for batching by mass shall conform to the applicable requirements 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. Tests shall be made at the frequency required in paragraph TESTS AND INSPECTIONS, and in the presence of a government inspector.

3.1.2.3 Batching Tolerances

a. Weighing Tolerances

MATERIAL	PERCENT OF REQUIRED MASS
Cementitious materials	0 to plus 2
Aggregate	plus or minus 2
Water	plus or minus 1
Chemical admixture	0 to plus 6

b. Volumetric Tolerances - For volumetric batching equipment, the following tolerances shall apply to the required volume of material being batched:

Water: ..... Plus or minus 1 percent.
Chemical admixtures: ..... Zero to plus 6 percent.

3.1.2.4 Moisture Control

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

3.1.3 Concrete Mixers

The concrete 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.

3.1.3.1 Stationary Mixers

Concrete plant mixers shall be tilting, nontilting, horizontal-shaft, vertical-shaft, or pugmill 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 applicable to central-mixed concrete.

3.1.3.2 Truck Mixers

Truck mixers, the mixing of concrete therein, and concrete uniformity shall conform to the requirements of ASTM C 94. A truck mixer may be used either for complete mixing (transit-mixed) or to finish the partial mixing done in a stationary mixer (shrink-mixed). Each truck shall be equipped with two counters from which it will be possible to determine the number of revolutions at mixing speed and the number of revolutions at agitating speed.

3.1.4 Conveying Equipment

The conveying equipment shall conform to the following requirements.

3.1.4.1 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 five times the nominal maximum-size aggregate, and the area of the gate opening shall not be less than 0.2 square meter. 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 1.5 cubic meters shall not be manually operated. The design of the bucket shall provide means for positive regulation of the amount and rate of deposit of concrete in each dumping position.

3.1.4.2 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 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.

3.1.4.3 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. Nonagitating equipment may be used for transporting plant-mixed concrete over a smooth road 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 control of the discharge of the concrete.

3.1.4.4 Chutes

When concrete can be placed directly from a truck mixer, agitator, or nonagitating equipment, the chutes 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.

3.1.4.5 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 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 900 mm. The belt speed shall be a minimum of 90 m per minute and a maximum of 230 m 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 trunk that is long enough to extend through the reinforcing bars.

3.1.4.6 Concrete Pumps

Concrete may be conveyed by positive displacement pump when approved. The pumping equipment shall be piston or squeeze pressure. The pipeline shall be rigid steel pipe or heavy-duty flexible hose. The inside diameter of the pipe shall be at least three times the nominal maximum-size coarse aggregate in the concrete mixture to be pumped but not less than 100 mm. Aluminum pipe shall not be used.

3.1.5 Vibrators

Vibrators of the proper size, frequency, and amplitude shall be used for the type of work being performed in conformance with the following requirements:

APPLICATION	HEAD DIAMETER mm	FREQUENCY VPM	AMPLITUDE mm
General construction	50 to 88	8,000 to 12,000	0.6 to 1.2

The frequency and amplitude shall be determined in accordance with COE CRD-C 521.

3.2 PREPARATION FOR PLACING

3.2.1 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. Embedded items shall be free of oil and other foreign matter such as loose coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable materials to prevent the entry of concrete into voids. Welding, including tack welding, will not be permitted on embedded metals within 600 mm of the surface of the concrete.

3.2.2 Concrete on Earth Foundations

Earth surfaces upon which concrete is to be placed shall be clean, damp, and free from debris, frost, ice, and standing or running water. Concrete shall not be placed on soft yielding and spongy earth foundation. Prior to placement of concrete, the earth foundation shall have been satisfactorily compacted in accordance with Section 02250 FILLS AND SUBGRADE PREPARATION. Additionally, the foundation shall be inspected by the Contractor prior to concrete placement in order certify that it is ready to receive concrete. The results of each inspection shall be submitted in writing.

3.2.3 Concrete on Rock Foundations

Rock surfaces upon which concrete is to be placed shall be clean, free from oil, standing or running water, ice, mud, drummy rock, coating, debris, and loose, semidetached, or unsound fragments. Joints in rock shall be cleaned to a satisfactory depth, as determined by the Contracting Officer, and to firm rock on the sides. Immediately before the concrete is placed, all rock surfaces shall be cleaned thoroughly by the use of air-water jets or sandblasting as described in paragraph CONSTRUCTION JOINT TREATMENT. All rock surfaces shall be kept continuously wet for at least 24 hours immediately prior to placing concrete thereon. All approximately horizontal surfaces shall be covered, immediately before the concrete is placed, with a layer of mortar proportioned similar to that in the concrete mixture. The mortar shall be covered with concrete before the time of initial setting of the mortar.

3.2.4 Construction Joint Treatment

Construction joint treatment shall conform to the following requirements.

3.2.4.1 Joint Preparation

Concrete surfaces to which additional concrete is to be bonded shall be prepared for receiving the next lift or adjacent concrete by cleaning with either air-water cutting, sandblasting, high-pressure water jet, or other approved method. Air-water cutting will not be permitted on formed surfaces or surfaces congested with reinforcing steel. Regardless of the method used, the resulting surfaces shall be free from all laitance and inferior concrete so that clean, well bonded coarse aggregate is exposed uniformly throughout the lift surface. The edges of the coarse aggregate shall not be undercut. The surface shall be washed clean again as the last operation prior to placing the next lift. There shall be no standing water on the surface upon which concrete is placed.

3.2.4.2 Air-Water Cutting

Air-water cutting of a construction joint shall be performed at the proper time and only on horizontal construction joints. The air pressure used in the jet shall be 620 to 760 kPa, and the water pressure shall be just sufficient to bring the water into effective influence of the air pressure. When approved by the Contracting Officer, a retarder complying with the requirements of COE CRD-C 94 may be applied to the surface of the lift to prolong the period of time during which air-water cutting is effective. Prior to receiving approval, the Contractor shall furnish samples of the material to be used and shall demonstrate the method to be used in applications. After cutting, the surface shall be washed and rinsed as long as there is any trace of cloudiness of the wash water. Where necessary to remove accumulated laitance, coatings, stains, debris, and other foreign material, high-pressure water jet or sandblasting will be required as the last operation before placing the next lift.

3.2.4.3 High-Pressure Water Jet

A stream of water under a pressure of not less than 20 MPa may be used for cleaning. Its use shall be delayed until the concrete is sufficiently hard so that only the surface skin or mortar is removed and there is no undercutting of coarse-aggregate particles. If the water jet is incapable of a satisfactory cleaning, the surface shall be cleaned by sandblasting.

3.2.4.4 Wet Sandblasting

This method may be used when the concrete has reached sufficient strength to prevent undercutting of the coarse aggregate particles. The surface of the concrete shall then be washed thoroughly to remove all loose materials.

3.2.4.5 Waste Disposal

The method used in disposing of waste water employed in cutting, washing, and rinsing of concrete surfaces shall be such that the waste water does not stain, discolor, or affect exposed surfaces of the structures, or damage the environment of the project area. The method of disposal shall be subject to approval.

3.3 PLACING

3.3.1 Placing Procedures

The surfaces of horizontal construction joints shall be kept continuously wet for the first 12 hours during the 24-hour period prior to placing concrete. Surfaces may be dampened immediately before placement if necessary. Concrete placement will not be permitted when, in the opinion of the Contracting Officer, weather conditions prevent proper placement and consolidation. Concrete shall be deposited as close as possible to its final position in the forms and, in so depositing, there shall be no vertical drop greater than 1.5 m except where suitable equipment is provided to prevent segregation and where specifically authorized. Depositing of the concrete shall be so regulated that it may be effectively consolidated in horizontal layers 600 mm or less in thickness with a minimum of lateral movement. The amount deposited in each location shall be that which can be readily and thoroughly consolidated. Sufficient placing capacity shall be provided so that concrete placement can be kept plastic and free of cold joints while concrete is being placed. Concrete shall be placed by methods that will prevent segregation or loss of ingredients. Any concrete transferred from one conveying device to another shall be passed through a hopper that is conical in shape. The concrete shall not be dropped vertically more than 1.5 m, except where a properly designed and sized elephant truck with rigid drop chute bottom section is provided to prevent segregation and where specifically authorized. In no case will concrete be discharged to free-fall through reinforcing bars.

3.3.2 Placement by Pump

When concrete is to be placed by pump, the nominal maximum-size coarse aggregate shall not be reduced to accommodate the pumps. The distance to be pumped shall not exceed limits recommended by the pump manufacturer. The concrete shall be supplied to the concrete pump continuously. When pumping is completed, concrete remaining in the pipeline shall be ejected without contamination of concrete in place. After each operation, equipment shall be thoroughly cleaned, and flushing water shall be wasted outside of the forms. Grout used to lubricate the pumping equipment at the beginning of the placement will not be incorporated into the placement.

3.3.3 Time Interval Between Mixing and Placing

Concrete shall be placed within 30 minutes after discharge into nonagitating equipment. When concrete is truck-mixed or when a truck mixer or agitator is used for transporting concrete mixed by a concrete plant mixer, the concrete shall be delivered to the site of the work, and discharge shall be completed within 1-1/2 hours after introduction of the cement to the aggregates. When the length of haul makes it impossible to deliver truck-mixed concrete within these time limits, batching of cement and a portion of the mixing water shall be delayed until the truck mixer is at or near the construction site.

3.3.4 Cold-Weather Placing

When concrete is likely to be subjected to freezing temperatures before the expiration of the curing period, it shall be placed in accordance with procedures previously submitted in accordance with paragraph SUBMITTALS. The ambient temperature of the space adjacent to the concrete placement and surfaces to receive concrete shall be above 0 degrees C. The placing temperature of the concrete having a minimum dimension less than 300 mm shall be between 12 and 24 degrees C when measured in accordance with ASTM C 1064. The placing temperature of the concrete having a minimum dimension greater than 300 mm shall be between 10 and 20 degrees C. Heating of the mixing water or aggregates will be required to regulate the concrete-placing temperatures. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals, or other materials shall not be mixed with the concrete to prevent freezing, except that a chemical accelerator may be used.

3.3.5 Hot-Weather Placing

Concrete shall be properly placed and finished with procedures previously submitted in accordance with paragraph SUBMITTALS. The concrete-placing temperature shall not exceed 30 degrees C when measured in accordance with ASTM C 1064. Cooling of the mixing water and aggregates, or both, may be required to obtain an adequate placing temperature. A retarder meeting the requirements of paragraph WATER-REDUCING OR RETARDING ADMIXTURES may be used to facilitate placing and finishing. Steel forms and reinforcement shall be cooled prior to concrete placement when steel temperatures are greater than 50 degrees C. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature.

3.3.6 Consolidation

Immediately after placement, each layer of concrete, including flowing concrete, shall be consolidated by internal vibrating equipment. Vibrators shall not be used to transport concrete within the forms. Hand spading may be required, if necessary, with internal vibrating along formed surfaces permanently exposed to view. Form or surface vibrators shall not be used unless specifically approved. The vibrator shall be inserted vertically at uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator. The vibrator shall penetrate rapidly to the bottom of the layer and at least 150 mm into the preceding unhardened layer if such exists. It shall be held stationary until the concrete is consolidated and then withdrawn slowly.

3.4 FINISHING

The ambient temperature of spaces adjacent to surfaces being finished shall be not less than 5 degrees C. In hot weather when the rate of evaporation of surface moisture, as determined by use of Figure 2.1.5 of ACI 305R, may reasonably be expected to exceed 1.0 kilogram per square meter per hour. Provisions for windbreaks, shading, fog spraying, or wet covering with a light-colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as finishing operations will allow. In addition to the above provisions the Contractor may elect to use a pre-cure finishing aid on any horizontal surface. The finishing aid

shall be applied at the manufacturers recommended rate immediately after screeding. The finishing aid shall be reapplied immediately after each subsequent finishing operation until the concrete is ready for the installation of the final curing method. All unformed surfaces that are not to be covered by additional concrete or backfill shall have a float finish, unless a trowel finish is specified, and shall be true to the elevation shown on the drawings. Surfaces to receive additional concrete or backfill shall be brought to the elevation shown on the drawings and left true and regular. Exterior surfaces shall be sloped for drainage unless otherwise shown in the drawing or as directed. Joints shall be carefully made with a jointing or edging tool. The finished surfaces shall be protected from stains or abrasions. Grate tampers or jitterbugs shall not be used.

3.4.1 Unformed Surfaces

3.4.1.1 Float Finish

A float finish shall be applied to the top of buried reinforced boxes. Surfaces shall be screeded and darbied or bullfloated to bring the surface to the required finish level with no coarse aggregate visible. No water, cement, or mortar shall be added to the surface during the finishing operation. The concrete, while still green but sufficiently hardened to bear a man's weight without deep imprint, shall be floated to a true and even plane. Floating may be performed by use of suitable hand floats or power-driven equipment. Hand floats shall be made of magnesium or aluminum.

3.4.1.2 Trowel Finish

A trowel finish shall be applied to the top of channel walls, street gutters, and as indicated on the drawings. Concrete surfaces shall be finished with a float finish, and after surface moisture has disappeared, the surface shall be troweled to a smooth, even, dense finish free from blemishes including trowel marks.

3.4.1.3 Broom Finish

A broom finish shall be applied to the face and surfaces of concrete channel inverts, and side slopes. The concrete shall be screeded and floated to required finish plane with no coarse aggregate visible. After surface moisture disappears the surface shall be broomed or brushed with a fine hair-broom or fiber bristle brush in a direction transverse to that of the channel centerline for all inverts and side slope areas, in a direction transverse to traffic across the weir, or as directed.

3.4.2 Formed Surfaces

Unless another finish is specified, surfaces shall be left with the texture imparted by the forms except that defective surfaces shall be repaired as described in paragraph FORMED SURFACE REPAIR. 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 is exposed to view. The form panels used to produce the finish shall be orderly in arrangement. Forms shall not be reused if there is any evidence

of surface wear or defects that would impair the quality of the surface.

3.4.3 Formed Surface Repair

After removal of forms, all ridges, lips, and bulges on surfaces permanently exposed shall be removed. All repairs shall be completed within 48 hours after form removal.

3.4.3.1 Classes A & B Finishes

Surfaces listed in Section 03101 FORMWORK FOR CONCRETE and as shown to have classes A and B finishes shall have surface defects repaired as follows: defective areas, voids, and honeycombs smaller than 10 000 square millimeters in area and less than 13 mm deep and bug holes exceeding 13 mm in diameter shall be chipped and filled with dry-packed mortar. Holes left by removal of tie rods shall be reamed and filled with dry-packed mortar as specified in paragraph MATERIAL AND PROCEDURE FOR REPAIRS. Defective and unsound concrete areas larger than described shall be defined by 13 mm deep dovetailed saw cuts in a rectangular pattern with lines parallel to the formwork, the defective concrete removed by chipping, and the void repaired with replacement concrete. The prepared area shall be brush-coated with an epoxy resin meeting the requirements of paragraph EPOXY RESIN, a latex bonding agent meeting the requirements of paragraph LATEX BONDING COMPOUND, or a neat cement grout after dampening the area with water. The void shall be filled with replacement concrete in accordance with paragraph MATERIAL AND PROCEDURE FOR REPAIRS.

3.4.3.2 Class D Finish

Surfaces listed in Section 03101 FORMWORK FOR CONCRETE and as shown to have class D finish shall have surface defects repaired as follows: defective areas, voids, and honeycombs greater than 30 000 square millimeters in area or more than 50 mm deep shall be defined by 13 mm deep dovetailed saw cuts in a rectangular pattern, the defective concrete removed by chipping and the void repaired with replacement concrete. The prepared area shall be brush-coated with an epoxy resin meeting the requirements of paragraph EPOXY RESIN, a latex bonding agent meeting the requirements of paragraph LATEX BONDING COMPOUND, or a neat cement grout after dampening the area with water. The void shall be filled with replacement concrete in accordance with paragraph MATERIAL AND PROCEDURE FOR REPAIRS.

3.4.3.3 Material and Procedure for Repairs

The cement used in the dry-packed mortar or replacement concrete shall be a blend of the cement used for production of project concrete and white portland cement properly proportioned so that the final color of the mortar or concrete will match adjacent concrete. Trial batches shall be used to determine the proportions required to match colors. Dry-packed mortar shall consist of one part cement to two and one-half parts fine aggregate. The fine aggregate shall be that used for production of project concrete. The mortar shall be remixed over a period of at least 30 minutes without addition of water until it obtains the stiffest consistency that will permit placing. Mortar shall be thoroughly compacted into the prepared void by tamping, rodding, ramming, etc. and struck off to match adjacent

concrete. Replacement concrete shall be produced using project materials and shall be proportioned by the Contractor and approved by the Contracting Officer. It shall be thoroughly compacted into the prepared void by internal vibration, tamping, rodding, ramming, etc. and shall be struck off and finished to match adjacent concrete. Forms shall be used to confine the concrete. If an expanding agent is used in the repair concrete, the repair shall be thoroughly confined on all sides including the top surface. Metal tools shall not be used to finish permanently exposed surfaces. The repaired areas shall be cured for 7 days. The temperature of the in situ concrete, adjacent air, and replacement mortar or concrete shall be above 5 degrees C during placement, finishing, and curing. Other methods and materials for repair may be used only when approved in writing by the Contracting Officer. Repairs of the so called "plaster-type" will not be permitted.

3.5 CURING AND PROTECTION

3.5.1 Duration

All concrete shall be cured by an approved method for a period of 7 days. Immediately after placement, concrete shall be protected from premature drying, extremes in temperatures, rapid temperature change, and mechanical damage. All materials and equipment needed for adequate curing and protection shall be available and at the placement site prior to the start of concrete placement. Concrete shall be protected from the damaging effects of rain for 12 hours and from flowing water for 14 days. No fire or excessive heat including welding shall be permitted near or in direct contact with concrete or concrete embedments at any time.

3.5.2 Moist Curing

Moist-cured concrete shall be maintained continuously, not periodically, wet for the entire curing period. If water or curing materials stain or discolor concrete surfaces that are to be permanently exposed, they shall be cleaned as required in paragraph APPEARANCE. Where wooden form sheathing is left in place during curing, the sheathing shall be kept wet at all times. Horizontal surfaces may be moist cured by ponding, by covering with a minimum uniform thickness of 50 mm of continuously saturated sand, or by covering with saturated nonstaining burlap or cotton mats. Horizontal construction joints may be allowed to dry for 12 hours immediately prior to the placing of the following lift.

3.5.3 Membrane-Forming Curing Compound

Concrete may be cured with an approved membrane-forming curing compound in lieu of moist curing except that membrane curing will not be permitted on any surface containing protruding steel reinforcement.

3.5.3.1 Application

The curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. The surfaces shall be thoroughly moistened with water, and the curing

compound applied as soon as free water disappears. The curing compound shall be applied to unformed surfaces as soon as free water has disappeared and bleeding has stopped. The curing compound shall be applied in a two-coat continuous operation by approved motorized power-spraying equipment operating at a minimum pressure of 500 kPa, at a uniform coverage of not more than 5 square meters per liter for each coat, and the second coat shall be applied perpendicular to the first coat. Concrete surfaces that 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. All concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from pedestrian and vehicular traffic and from any other cause that will disrupt the continuity of the curing membrane.

3.5.4 Evaporation Retardant

Any horizontal concrete surface may be cured using sheet material. All surfaces shall be thoroughly wetted and be completely covered with waterproof paper or polyethylene-coated burlap having the burlap thoroughly water-saturated before placing. Covering shall be laid with light-colored side up. Covering shall be lapped not less than 300 mm and securely weighted down or shall be lapped not less than 100 mm and taped to form a continuous cover with completely closed joints. The sheet shall be weighted to prevent displacement so that it remains in contact with the concrete during the specified length of curing. Coverings shall be folded down over exposed edges of slabs and secured by approved means. Sheets shall be immediately repaired or replaced if tears or holes appear during the curing period.

3.5.5 Cold-Weather Curing and Protection

When the daily outdoor low temperature is less than 0 degrees C, the temperature of the concrete shall be maintained above 5 degrees C for the first 7 days after placing. In addition, 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 15 degrees C as determined by observation of ambient and concrete temperatures indicated by suitable temperatures measuring devices furnished by the Government as required and installed adjacent to the concrete surface and 50 mm inside the surface of the concrete. The installation of the thermometers shall be made by the Contractor at such locations as may be directed. Curing compounds shall not be used on concrete surfaces that are maintained at curing temperature by use of free steam.

3.5.6 Nonshrink Grout Application

Nonshrink grout shall conform to the requirements of paragraph NONSHRINK GROUT. Water content shall be the minimum that will provide a flowable mixture and fill the space to be grouted without segregation, bleeding, or reduction of strength. Mixing and placing shall be in conformance with the material manufacturer's instructions and as specified.

3.6 TESTS AND INSPECTIONS

Tests and inspections shall conform to the following requirements.

3.6.1 General

The Contractor shall perform the inspections and tests described below, and, based upon the results of these inspections and tests, he shall take the action required and submit reports as required. When, in the opinion of the Contracting Officer, the concreting operation is out of control, concrete placement shall cease. The laboratory performing the tests shall conform with ASTM C 1077. The individuals who sample and test concrete or the constituents of concrete as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.6.2 Testing and Inspection Requirements

3.6.2.1 Fine Aggregate

a. Grading - At least once during each shift when the concrete is being delivered, 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 size range of 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. Results of tests shall be reported in writing.

b. Corrective Action for Fine Aggregate Grading - 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 be reported to the Contracting Officer.

c. Moisture Content Testing - When in the opinion of the Contracting Officer the electric moisture meter is not operating satisfactorily, there shall be at least four tests for moisture content in accordance with ASTM C 566 during each 8-hour period of mixing plant operation. The times for the tests shall be selected randomly within the 8-hour period. An additional test shall be made whenever the slump is shown to be out of control or excessive variation in workability is reported by the placing foreman. When the electric moisture meter is operating satisfactorily, at least two direct measurements of moisture content shall be made per week to check the calibration of the meter.

d. Moisture Content Corrective Action - Whenever the moisture content of the fine aggregate changes by 0.5 percent or more, the scale settings for the fine-aggregate batcher and water batcher shall be adjusted (directly or by means of a moisture compensation device) if necessary to maintain the specified slump.

3.6.2.2 Coarse Aggregate

a. Grading - At least once during each shift in which the concrete is being delivered, 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 which are coarser than the specification limits for samples taken at locations other than as delivered to the mixer to allow for degradation during handling. Results of tests shall be reported in writing.

b. Corrective Action for Grading - 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 five 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.

c. Coarse Aggregate Moisture Content - A test for moisture content of each size group of coarse aggregate in accordance with ASTM C 566 or COE CRD-C 112 shall be made at least once per shift. When two consecutive readings for smallest size coarse aggregate differ by more than 1.0 percent, frequency of testing shall be increased to that specified above for fine aggregate, until the difference falls below 1.0 percent. These results shall be used to adjust the added water in the control of the batch plant.

d. Coarse Aggregate Moisture Corrective Action - Whenever the moisture content of any size of coarse aggregate changes by 0.5 percent or more, the scale setting for the coarse aggregate batcher and the water batcher shall be adjusted if necessary to maintain the specified slump.

e. Deleterious Substances - When in the opinion of the Contracting Officer a problem exists in connection with deleterious substances in fine or coarse aggregates, tests shall be made in accordance with ASTM C 33 at a frequency not less than one per week. Results of tests shall be reported in writing.

f. Corrective Action for Deleterious Substances - When the results for a deleterious substance is outside the specification limits, the aggregate shall be immediately resampled and retested. If the second sample fails, that fact shall be reported to the Contracting Officer. Where material finer than No. 200 sieve for coarse aggregate exceeds the specification limit, immediate steps, such as washing or other corrective actions, shall be taken to correct the grading.

3.6.2.3 Scales

a. Weighing Accuracy - The accuracy of the scales shall be checked by test weights prior to start of concrete operations and at least once every month for conformance with the applicable requirements of paragraph BATCHING

EQUIPMENT. Such tests shall also be made as directed whenever there are variations in properties of the fresh concrete that could result from batching errors. Results of tests shall be reported in writing.

b. Batching and Recording Accuracy - Once a week the accuracy of each batching and recording device shall be checked during a weighing operation by noting and recording the required weight, recorded weight, and the actual weight batched. The Contractor shall confirm that the calibration devices described in paragraph BATCH PLANT for checking the accuracy of dispensed admixtures are operating properly. Results of tests shall be reported in writing.

c. Scales Corrective Action - 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.

3.6.2.4 Batch-Plant Control

The measurement of all constituent 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 used, amount and source of admixtures used, aggregate source, the required aggregate and water weights per cubic meter amount of water as free moisture in each size of aggregate, and the batch aggregate and water weights per cubic meter for each class of concrete batched during plant operation. The report shall be submitted to the Contracting Officer.

3.6.2.5 Concrete Mixture

a. Air Content Testing - 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 quality assurance representative. Tests shall be made in accordance with ASTM C 231. For concrete having a nominal maximum aggregate size of 25 or 37 mm, the average of each set of two tests shall be plotted on a control chart on which the average is set at 5.5 percent and the upper and lower control limits at 7 and 4 percent respectively. For concrete having a nominal maximum aggregate size of 19 mm, the average shall be set at 6.0 percent and the upper and lower control limits at 7.0 and 5.0 percent, respectively. The control charts shall be submitted to the Contracting Officer.

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 is practical after each adjustment, another test shall be made to verify the result of the adjustment. Whenever a point on the control chart 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. All this shall be at no extra cost to the Government.

c. Slump Testing - At least two slump tests shall be made on randomly selected batches in accordance with ASTM C 143 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's quality assurance representative. The average of each set of two tests shall be plotted on a control chart on which the upper and lower limits are set 38 mm above and below the mid-range value. The range shall be plotted on a control chart on which the upper control limit is 75 mm. The control chart shall be submitted to the Contracting Officer.

d. Slump Corrective Action - Whenever points on the control chart for slump reach the upper warning limit, an adjustment shall be immediately 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 specified, based upon 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 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. Also, additional slump tests shall be made as directed. All this shall be at no additional cost to the Government.

e. Batch Tickets - The manufacturer of the concrete shall furnish to the Government's quality assurance representative with each batch of concrete, before unloading at the site, a delivery ticket prepared in accordance with the requirements of ASTM C 94.

3.6.2.6 Inspection Before Placing

Foundation or construction joints, forms, and embedded items shall be inspected for quality by the Contractor in sufficient time prior to each concrete placement to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing not less than 2 hours prior to placement or by 4:00 P.M. for placements prior to 9:00 A.M. the following day.

3.6.2.7 Placing

a. Placing Inspection - The placing foreman shall supervise all placing operations, shall determine that the correct quality of concrete or grout

is placed in each location as directed and shall be responsible for measuring and recording concrete temperatures and ambient temperature hourly during placing operations, weather conditions, time of placement, yardage placed, and method of placement. A report shall be submitted in writing to the Contracting Officer.

b. Placing Corrective Action - The placing foreman shall not permit batching and placing to begin until he has 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.

3.6.2.8 Vibrators

a. Vibrator Testing and Use - 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 at the same time the vibrator is operating in concrete with the tachometer 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.

b. Vibrator Corrective Action - Any vibrator not meeting the requirements of paragraph VIBRATORS shall be immediately removed from service and repaired or replaced.

3.6.2.9 Curing

a. Moist-Curing Inspections - At least once per day 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 such areas shall be extended by one (1) day.

c. Membrane-Curing Inspection - No curing compound shall be applied until the Contractor's authorized representative has verified that the compound is properly mixed and ready for spraying. At the end of each operation, he shall estimate the quantity of compound used by measurement of the container and the area of concrete surface covered and compute the rate of coverage in square meters per liter. He 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 day an inspection shall be made of all areas being cured using material 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 one (1) day.

3.6.2.10 Cold-Weather Protection and Sealed Insulation Curing

At least once per day an inspection shall be made of all areas subject to cold-weather protection. The protection system shall be inspected for holes, tears, unsealed joints, or other deficiencies that could result in damage to the concrete. Special attention shall be taken at edges, corners, and thin sections. Any deficiencies shall be noted, corrected, and reported. During removal of cold-weather protection, measurement of concrete and ambient temperature shall be made at least hourly. A report shall be submitted in writing to the Contracting Officer.

3.6.2.11 Cold-Weather Protection Corrective Action

When a daily inspection report lists any holes, tears, unsealed joints, or other deficiencies, the deficiency shall be corrected immediately and the period of protection extended 1 day.

3.6.2.12 Mixer Uniformity

a. Stationary Mixers - Prior to the start of concrete placing and once every 6 months when concrete is being placed, uniformity of concrete mixing shall be determined in accordance with ASTM C 94. Whenever adjustments in mixer or increased mixing times are necessary because of failure of any mixer to comply, the mixer shall be retested after adjustment. Results of tests shall be reported in writing.

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 shall be determined in accordance with ASTM C 94. The truck mixers shall be selected randomly for testing. When satisfactory performance is found in one truck mixer, the performance of mixers of substantially the same design and condition of the blades may be regarded as satisfactory. Results of tests shall be reported in writing.

3.6.2.13 Mixer Uniformity Corrective Action

When a mixer fails to meet mixer uniformity requirements, either the mixer shall be removed from service on the work, the mixing time shall be increased, batching sequence changed, batch size reduced, or adjustments shall be made to the mixer until compliance is achieved.

3.6.3 Reports

All results of tests or inspections conducted shall be reported informally as they are completed and as required. 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 test and inspection records.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05500

MISCELLANEOUS METAL

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 GENERAL REQUIREMENTS
1.4 DISSIMILAR MATERIALS
1.5 WORKMANSHIP
1.6 ANCHORAGE
1.7 SHOP PAINTING

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 General
2.1.2 Structural Shapes and Plates
2.1.3 Steel Pipes
2.1.4 Corrosion-Resisting Steel Bolts and Anchor Bolts
2.1.5 Bolts
2.1.6 Nuts
2.1.7 Expansion Anchors
2.1.8 Concrete, Mortar and Grout
2.1.9 Steel Safety Railing, Including Carbon Steel Inserts
2.1.10 Chain Safety Gate
2.1.11 Wall ladder Rungs
2.2 MISCELLANEOUS
2.3 TRENCH COVERS, FRAMES, AND LINERS

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS
3.2 INSTALLATION OF PIPE GUARDS
3.3 PIPE SAFETY RAILING AND GATES
3.3.1 Attachment oF Handrails
3.3.1.1 Installation of Steel Handrails
3.3.1.2 Mounting of Safety Chains

-- End of Section Table of Contents --

SECTION 05500

MISCELLANEOUS METAL

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A14.3	(1992) Ladders - Fixed - Safety Requirements

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36	(1996) Carbon Structural Steel
ASTM A 53	(1996) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 123	(1989a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 283	(1993a) Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A 467	(1993) Machine and Coil Chain
ASTM A 500	(1993) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A 653	(1996) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 924	(1996a) Steel Sheet, Metallic-Coated by the Hot-Dip Process

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(1994) Structural Welding Code - Steel

FEDERAL SPECIFICATIONS (FS)

FS FF-B-575	(Rev C) Bolts, Hexagon and Square

FS FF-N-836	(Rev D; Am 3) Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat.
FS FF-S-325	(Bais; Int Am 3; Notice 1) Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry)
FS QQ-S-763	(Rev E; Am 1) Steel Bars, Wire, Shapes, and Forgings, Corrosion Resisting)

1.2 SUBMITTALS

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

SD-04 Drawings

Miscellaneous Metal Items; GA.

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: Pipe safely railing

SD-14 Samples

1.3 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123, 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.

1.4 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 be protected with a coat of bituminous paint or asphalt varnish.

1.5 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.

1.6 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.

1.7 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.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Materials indicated on the drawings or required in the work and not covered elsewhere by detailed requirements shall conform to the requirements of this section. In all cases not specifically covered in these specifications, the Contractor shall furnish approved highest grade commercial materials or products which are suitable for intended use of the item.

2.1.2 Structural Shapes and Plates

Steel bars, shapes and plates shall conform to ASTM A 36. Galvanized coatings where required, shall conform to ASTM A 123.

2.1.3 Steel Pipes

Steel pipe shall be zinc-coated steel pipe conforming to the requirements

of ASTM A 120, Standard Weight, Schedule 40.

2.1.4 Corrosion-Resisting Steel Bolts and Anchor Bolts

Corrosion-resisting steel bolts and anchor bolts shall conform to FS QQ-S-763, Class 304, Condition A, or the applicable requirements of ASTM A 320, Grade B8.

2.1.5 Bolts

Bolts shall confirm to FS FF-B-575. Bolts and anchor bolts shall conform to FS QQ-S 763, Class 304, Condition A, or the applicable requirements of ASTM A 320, Grade B8.

2.1.6 Nuts

Nuts shall confirm to FS FF-N-836. Nuts shall be galvanized

2.1.7 Expansion Anchors

Expansion anchors shall conform to the applicable requirements of FF-S-325. Anchors shall be multiple unit with inside thread.

2.1.8 Concrete, Mortar and Grout

Concrete, motar and grout shall conform to the requirements of Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE

2.1.9 Steel Safety Railing, Including Carbon Steel Inserts

Steel safety railing, including inserts in concrete, shall be steel pipe conforming to ASTM A 53or structural tubing conforming to ASTM A 500, Grade A or B of equivalent strength. Steel railings shall be 38 mm nominal size. Railings shall be hot-dip galvanized after fabrication in the shop. Pipe collars shall be hot-dip galvanized steel.

a. 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 10 mm 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 150 mm 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.

2.1.10 Chain Safety Gate

Safety chains shall be galvanized welded steel, proof coil chain tested in accordance with ASTM A 467, Class CS. Safety chains shall be straight link style, 5 mm diameter, minimum 39 links per meter (12 links per foot) and with bolt type snap hooks on one end. Eye bolts for attachment of chains shall be galvanized 10 mm bolt with 19 mm eye, anchored as indicated. The safety chain shall accommodate a eye bolt snap as indicated on the drawings.

2.1.11 Wall ladder Rungs

Wall ladder rungs shall be galvanized steel. Steel bars, shapes and plates shall conform to ASTM A 36 . Galvanized coatings shall conform to ASTM A 123.

2.2 MISCELLANEOUS

Miscellaneous plates and shapes for items that do not form a part of the structural steel framework, such as lintels, sill angles, miscellaneous mountings, and frames, shall be provided to complete the work.

2.3 TRENCH COVERS, FRAMES, AND LINERS

Trench covers shall be designed to meet the indicated load requirements. Trench frames and anchors shall be all welded steel construction designed to match cover. Covers shall [be secured to frame] [have flush drop handles formed of 6 mm round stock], and shall be [raised-tread, or steel floor plate] [cast-iron grating]. Grating opening widths shall not exceed 25 mm. Trench liners shall be cast iron with integral frame for cover.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION 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 PIPE GUARDS

Pipe guards shall be set vertically in concrete piers. Piers shall be constructed of, and the hollow cores of the pipe filled with, concrete specified in SECTION 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.3 PIPE SAFETY RAILING AND GATES

Pipe Safety Railing and gates shall be galvanized after fabrication in the shop. Care shall be taken to deform pipe without "breaking" the steel. Any pipe deformations that demonstrate visible cracking or weaking may be cause for rejection. The pipe gate components shall be galvanized. Welded, cut, damaged, and deformed area of galvanizing metal shall be neatly coated with Grade 50B solder conforming to ASTM B 32. The Contractor shall grease pipe thoroughly with grease conforming to FS VV-G-632 immediately after installation of chains at each gate opening. The Contractor shall examine and certify the operation of all safety pipe railing not sooner then 30 days after installation.

3.3.1 Attachment oF Handrails

Splices, where required, shall be made at expansion joints. Removable sections shall be installed as indicated.

3.3.1.1 Installation of Steel Handrails

Installation shall be in pipe sleeves embedded in concrete and filled with molten lead or sulphur with anchorage covered with standard pipe collar pinned to post. Rail ends shall be secured by steel pipe flanges.

3.3.1.2 Mounting of Safety Chains

Safety chains shall be mounted 900 mm and 610 mm above the floor.

-- End of Section --