

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE PAGE OF PAGES
1 116

2. AMENDMENT/MODIFICATION NO. 0004	3. EFFECTIVE DATE 27 August 2003	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
6. ISSUED BY Contracting Division USACE, Los Angeles District P.O. Box 352711 Los Angeles, CA 90053-2325	CODE CESPL-CT-E	7. ADMINISTERED BY (If other than Item 6) Tropicana Project Office 4440 South Durango Drive Suite D Las Vegas, NV 89147	CODE CESPL-CO-AV

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)	<input checked="" type="checkbox"/>	9A. AMENDMENT OF SOLICITATION NO. DACW09-03-B-0005
	<input checked="" type="checkbox"/>	9B. DATED (SEE ITEM 11) 9 June 2003
		10A. MODIFICATION OF CONTRACTS/ORDER NO.
		10B. DATED (SEE ITEM 13)
CODE	FACILITY CODE	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

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

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

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

<input checked="" type="checkbox"/>	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.)

The following drawing sheets have been modified: T2, T6, T7, T8, T11, C3, C4, C5, C6, C8, C9, C13, C14, C15, C17, C19, C24A, C29, C30, C36, S4, S5, S10, S14, S17, L1, D6, D16, and D17. See attached.

The following sections have changed: 0000BS (Bid Schedule; Document Section 00010), 01200, 1270, 02821, and 02300. See attached. These sections contain 115 total pages. This ammendment contains 116 pages, exclusive of the drawings listed above.

Bid opening date and time has changed from 1300 4 September 2003 to 1300 9 September 2003.

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

DOCUMENT TABLE OF CONTENTS

DIVISION 00 - DOCUMENTS

SECTION 00010

BID SCHEDULE

PART 1 GENERAL

1.1 Bid Items

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

-- End of Document Table of Contents --

SECTION 00010

BID SCHEDULE

PART 1 GENERAL

Note : Some of the lump sum and unit price items reference drawings and plans that utilize English units of measurements.

1.1 Bid Items

Item	Description	Quantity	Unit		
			Unit	Price	Amount
0001	TRAFFIC CONTROL	1.00	LS	\$____.____	\$_____.____
0002	DIVERSION AND CONTROL OF WATER	1.00	LS	\$____.____	\$_____.____
0003	CLEAR SITE AND REMOVE OBSTRUCTIONS	1.00	LS	\$____.____	\$_____.____
0004	STRIP AND STOCKPILE TOPSOIL, BLM LANDS	2,655	m ³	\$____.____	\$_____.____
0005	EXCAVATION CHANNEL, NON BLM LAND	133,404	m ³	\$____.____	\$_____.____
0006	EXCAVATION CHANNEL, BLM LAND	10,792	m ³	\$____.____	\$_____.____
0007	EXCAVATION INLET STRUCTURE, BLM LAND	6,786	m ³	\$____.____	\$_____.____
0008	COMPACTED FILL, CHANNEL, NON BLM LAND	108,705	m ³	\$____.____	\$_____.____
0009	COMPACTED FILL, CHANNEL, BLM LAND	10,050	m ³	\$____.____	\$_____.____
0010	COMPACTED FILL, INLET STRUCTURE EMBANKMENT AND INVERT, BLM LAND	14,958	m ³	\$____.____	\$_____.____
0011	MISCELLANEOUS FILL, INLET STRUCTURE EMBANKMENT AND INVERT, BLM LAND	8,979	m ³	\$____.____	\$_____.____

Item	Description	Quantity	Unit	Unit Price	Amount
0012	PLANT NURSERY AREA, TEMPORARY	1.00	LS	\$____.____	\$____.____
0013	OVERBURDEN RHODES RANCH	19,991	m ³	\$____.____	\$____.____
0014	CONCRETE, CHANNEL INVERT SLAB	3,100	m ³	\$____.____	\$____.____
0015	CONCRETE, CHANNEL WALLS	3,206	m ³	\$____.____	\$____.____
0016	CONCRETE OVERFLOW STRUCTURE STA. 43+15.428	1.00	LS	\$____.____	\$____.____
0017	CONCRETE OVERFLOW STRUCTURE STA. 40+68.000	1.00	LS	\$____.____	\$____.____
0018	CONCRETE OVERFLOW STRUCTURE STA. 37+88.000	1.00	LS	\$____.____	\$____.____
0019	CONCRETE OVERFLOW STRUCTURE STA. 31+04.220	1.00	LS	\$____.____	\$____.____
0020	GROUTED RIPRAP	261	m ³	\$____.____	\$____.____
0021	REINFORCING STEEL	568	t	\$____.____	\$____.____
0022	AGGREGATE BASE COURSE	1,975	t	\$____.____	\$____.____
0023	ASPHALT CONCRETE PAVEMENT	1,280	t	\$____.____	\$____.____
0024	WEEPHOLE SYSTEM	1.00	LS	\$____.____	\$____.____
0025	RCB CHANNEL AND BELTWAY LATERAL CONFLUENCE STRUCTURE	1.00	LS	\$____.____	\$____.____
0026	CHANNEL AND A PORTION OF BELTWAY LATERAL STRUCTURE	1.00	LS	\$____.____	\$____.____
0027	RCB CHANNEL FRONTAGE ROAD	1.00	LS	\$____.____	\$____.____
0028	RCB CHANNEL TIBERTI NORTH	1.00	LS	\$____.____	\$____.____
0029	CHANNEL AND RHODES RANCH CONFLUENCE STRUCTURE	1.00	LS	\$____.____	\$____.____

Item	Description	Quantity	Unit	Unit Price	Amount	
0030	CHANNEL AND A PORTION OF RHODES RANCH LATERAL STRUCTURE	1.00	LS	\$____.____	\$_____.____	
0031	RHODES RANCH LATERAL	1.00	LS	\$____.____	\$_____.____	
0032	RHODES RANCH LATERAL END	1.00	LS	\$____.____	\$_____.____	
0033	RCB CHANNEL RHODES RANCH	1.00	LS	\$____.____	\$_____.____	
0034	RCB CHANNEL WINDMILL ROAD THROUGH SHELBOURNE AVE	1.00	LS	\$____.____	\$_____.____	
0035	INVERT ACCESS RAMP 1	1.00	LS	\$____.____	\$_____.____	
0036	INVERT ACCESS RAMP 2	1.00	LS	\$____.____	\$_____.____	
0037	INVERT ACCESS RAMP 3	1.00	LS	\$____.____	\$_____.____	
0038	INLET STRUCTURE SOIL CEMENT ARMOR	2,800	m ³	\$____.____	\$_____.____	
0039	PORTLAND CEMENT FOR SOIL CEMENT	438	t	\$____.____	\$_____.____	
0040	POZZOLAN FOR SOIL CEMENT	77	t	\$____.____	\$_____.____	
0041	INLET STRUCTURE OUTLET RCB	1.00	LS	\$____.____	\$_____.____	
0042	INLET STRUCTURE OUTLET TOWER	1.00	LS	\$____.____	\$_____.____	
0043	SIDE DRAIN, STA. 47+38.569 RT	1.372	1.00	LS	\$____.____	\$_____.____
0044	SIDE DRAIN, STA. 35+66.161 RT	0.762	1.00	LS	\$____.____	\$_____.____
0045	SIDE DRAIN, STA. 34+77.325 RT	0.762	1.00	LS	\$____.____	\$_____.____
0046	SIDE DRAIN, STA. 30+22.976 LT	0.610	1.00	LS	\$____.____	\$_____.____
0047	SIDE DRAIN, STA. 22+82.178 RT	0.610	1.00	LS	\$____.____	\$_____.____
0048	SIDE DRAIN, STA. 20+76.333 RT	0.914	1.00	LS	\$____.____	\$_____.____
0049	MANHOLES FOR RCB CONDUITS, CULVERTS, AND LATERALS	1.00	LS	\$____.____	\$_____.____	

Item	Description	Quantity	Unit	Unit Price	Amount
0050	ROAD DETOURS AT BELTWAY	1.00	LS	\$____.____	\$____.____
0051	EASTBOUND FRONTAGE ROAD REMOVAL AND RECONSTRUCTION	1.00	LS	\$____.____	\$____.____
0052	CHAIN LINK FENCE, 1.829 M HIGH 9 GAGE	1,553	m	\$____.____	\$____.____
0053	POST AND CABLE RAILING	4,758	m	\$____.____	\$____.____
0054	DOUBLE SWING GATES	5	ea	\$____.____	\$____.____
0055	PRE-EMERGENT HERBICIDE AND PIGMENTED DUST PALLIATIVE/SOIL STABILIZER ON NON-REVEGETATED AREAS OF INLET STRUCTURE AND CHANNEL	3.5	HA	\$____.____	\$____.____
0056	STATION MARKINGS	1.00	LS	\$____.____	\$____.____
0057	AS-BUILT DRAWINGS	1.00	LS	\$____.____	\$____.____
0058	LADDER SYSTEMS	1.00	LS	\$____.____	\$____.____
0059	SINGLE SWING GATES, MANWAY, 1.000 X 1.829	2	ea	\$____.____	\$____.____
0060	BASIN TRESPASS PREVENTION DEVICES - BOLLARDS	1.00	LS	\$____.____	\$____.____
0061	DURANGO DRIVE REMOVAL AND RECONSTRUCTION	1.00	LS	\$____.____	\$____.____
0062	PROVIDE PLANT STORAGE IRRIGATION DURING CONSTRUCTION	1.00	LS	\$____.____	\$____.____
0063	PROVIDE IRRIGATION FOR 1 YEAR AFTER CONSTRUCTION	1.00	LS	\$____.____	\$____.____
0064	ONE YEAR GUARANTEE ON LANDSCAPE WORK AT INLET STRUCTURE	1.00	LS	\$____.____	\$____.____
0065	TORTOISE FENCE, INLET STRUCTURE	2,000	m	\$____.____	\$____.____
0066	SALVAGE, STORE, AND MAINTAIN PLANTS - CACTUS	1	ea	\$____.____	\$____.____

Item	Description	Quantity	Unit	Unit Price	Amount
0067	SALVAGE, STORE, AND MAINTAIN PLANTS - CREOSOTE BUSH	20	ea	\$____.____	\$_____.____
0068	SALVAGE, STORE, AND MAINTAIN PLANTS - WHITE BURSAGE	20	ea	\$____.____	\$_____.____
0069	SALVAGE, STORE, AND MAINTAIN PLANTS - MOHAVE YUCCA	6	ea	\$____.____	\$_____.____
0070	TRANSPLANT CACTUS	1	ea	\$____.____	\$_____.____
0071	TRANSPLANT CREOSOTE BUSH	20	ea	\$____.____	\$_____.____
0072	TRANSPLANT WHITE BURSAGE	20	ea	\$____.____	\$_____.____
0073	TRANSPLANT MOHAVE YUCCA	6	ea	\$____.____	\$_____.____
0074	PLACE TOPSOIL TO FINISH GRADE, DOWNSTREAM SURFACE INLET STRUCTURE EMBANKMENT	2,655	m ³	\$____.____	\$_____.____
0075	SEEDING AND FERTILIZATION, DOWNSTREAM SURFACE INLET STRUCTURE EMBANKMENT	4.1	HA	\$____.____	\$_____.____
0076	PROVIDE BROWSE PROTECTION	40	ea	\$____.____	\$_____.____
0077	SIMULATED DESERT VARNISH ROCK COLOR MITIGATION	1.00	LS	\$____.____	\$_____.____
0078	SOIL SAMPLING AND TESTING FOR FERTILITY	4	ea	\$____.____	\$_____.____
0079	PIGMENTED DUST PALLIATIVE/SOIL STABILIZER ONLY ON REVEGETATED AREAS	4.1	HA	\$____.____	\$_____.____
0080	PROVIDE CHANNEL EXCAVATION SHORING ON WEST SIDE OF EXCAVATION FROM STA. 35+57.644 TO STA. 35+02.853 AND STA. 34+86.656 TO STA. 34+40.000 TO PROTECT STREET IMPROVEMENTS	1.00	LS	\$____.____	\$_____.____

Item	Description	Quantity	Unit	Price	Amount
0081	PROVIDE CHANNEL EXCAVATION SHORING ON WEST SIDE OF EXCAVATION FROM STA. 34+40.000 TO STA. 34+16.498 AND ON EAST SIDE OF EXCAVATION FROM STA. 34+30.000 TO STA. 33+02.481 TO PROTECT STREET AND LANDSCAPING IMPROVEMENTS	1.00	LS	\$____.____	\$_____.____
0082	RHODES RANCH ENTRY PHASE 1 DETOUR	1.00	LS	\$____.____	\$_____.____
0083	RHODES RANCH ENTRY PHASE 2 DETOUR	1.00	LS	\$____.____	\$_____.____
0084	RHODES RANCH ENTRY REMOVAL AND RECONSTRUCTION	1.00	LS	\$____.____	\$_____.____
0085	DURANGO DRIVE ROAD CLOSURE - ROBINDALE ROAD TO WIGWAM AVENUE	1.00	LS	\$____.____	\$_____.____
0086	RCB CHANNEL UNDER BELTWAY ON RAMP	1.00	LS	\$____.____	\$_____.____
0087	ORNAMENTAL METAL FENCING	1,236.0	M	\$____.____	\$_____.____
0088	ORNAMENTAL METAL FENCING GATES	2	EA	\$____.____	\$_____.____
0089	UTILITY CROSSING ITEMS	1.00	LS	\$____.____	\$_____.____
0090	OUTLET CONDUIT SIDE DRAIN STRUCTURE, STA. 51+03.000 RT 0.910 x 0.910	1.00	LS	\$____.____	\$_____.____
0091	1.829 M x 1.524 M SIDE DRAIN STRUCTURE, STA. 13+40.000 LT	1.00	LS	\$____.____	\$_____.____
0092	WALL TRANSITION STRUCTURE STA. 49+00.000 TO STA. 48+40.000	1.00	LS	\$____.____	\$_____.____
0093	WALL TRANSITION STRUCTURE STA. 43+30.730 TO STA. 43+23.130	1.00	LS	\$____.____	\$_____.____
0094	WALL TRANSITION STRUCTURE STA. 37+46.980 TO STA. 37+35.580	1.00	LS	\$____.____	\$_____.____

Item	Description	Quantity	Unit	Unit	
				Price	Amount
0095	WALL TRANSITION STRUCTURE STA. 33+65.000 TO STA. 33+59.600	1.00	LS	\$____.____	\$_____.____
0096	WALL TRANSITION STRUCTURE STA. 30+29.440 TO STA. 30+18.420	1.00	LS	\$____.____	\$_____.____
0097	WALL TRANSITION STRUCTURE STA. 22+84.000 TO STA. 22+71.300	1.00	LS	\$____.____	\$_____.____
0098	WALL TRANSITION STRUCTURE STA. 16+52.700 TO STA. 16+40.000	1.00	LS	\$____.____	\$_____.____
0099	WALL TRANSITION STRUCTURE STA. 15+70.000 TO STA. 15+57.300	1.00	LS	\$____.____	\$_____.____
0100	WALL TRANSITION STRUCTURE STA. 12+80.000 TO STA. 12+67.938	1.00	LS	\$____.____	\$_____.____
0101	UTILITY MARKERS	26	EA	\$____.____	\$_____.____
0102	CONCRETE OVERFLOW STRUCTURE STA. 17+04.885	1.00	LS	\$____.____	\$_____.____
0103	ADJUST SEWER MANHOLE FRAMES AND COVERS BETWEEN STATION 43+30.730 THROUGH STATION 37+00.000	10	EA	\$____.____	\$_____.____
0104	RCB CHANNEL LOUGHTON POWERS	1.00	LS	\$____.____	\$_____.____
0105	RCB CHANNEL BADURA	1.00	LS	\$____.____	\$_____.____
0106	OVERBURDEN RHODES RANCH ENTRYWAY	5,028	m ³	\$____.____	\$_____.____
0107	WALL TRANSITION STRUCTURE STA. 21+15.700 TO STA. 21+03.000	1.00	LS	\$____.____	\$_____.____
0108	PROTECT IN-PLACE ARLINGTON RANCH SEWER LINE	1.00	LS	\$____.____	\$_____.____
0109	ADJUST ARLINGTON RANCH SEWER MANHOLES	1.00	LS	\$____.____	\$_____.____

Item	Description	Quantity	Unit	Price	Amount	
0110	CHAIN LINK FENCE, 1.219 M HIGH	684	m	\$____.____	\$_____.____	
0111	WALL TRANSITION STRUCTURE STA. 17+90.000 TO STA. 17+80.900	1.00	LS	\$____.____	\$_____.____	
0112	RCB CHANNEL TIBERTI SOUTH	1.00	LS	\$____.____	\$_____.____	
0113	SINGLE SWING GATES, 1.000 X 1.219	6	ea	\$____.____	\$_____.____	
0114	BELTWAY LATERAL TRANSITIONAL RCB STRUCTURE AT DURANGO DRIVE	1.00	LS	\$____.____	\$_____.____	
0115	ORNAMENTAL METAL FENCE GATES, SINGLE SWING, 1.000 X 1.800	6	ea	\$____.____	\$_____.____	
0116	CHAIN LINK FENCE, 1.829 M HIGH 11 GAGE	899	m	\$____.____	\$_____.____	
0118	SIDE DRAIN, STA. 44+20.000 RT	0.610	1.00	LS	\$____.____	\$_____.____
0119	SIDE DRAIN, STA. 44+20.000 LT	0.610	1.00	LS	\$____.____	\$_____.____
0120	SIDE DRAIN, STA. 39+40.000 LT	0.610	1.00	LS	\$____.____	\$_____.____
0121	SIDE DRAIN, STA. 36+20.000 LT	0.610	1.00	LS	\$____.____	\$_____.____
0122	SIDE DRAIN, STA. 12+00.000 RT	0.610	1.00	LS	\$____.____	\$_____.____
0123	REMOVE, SALVAGE AND REPLACE FENCE	536	m	\$____.____	\$_____.____	
TOTAL ESTIMATED AMOUNT				\$_____.	_____.	

Abbreviations:

m = meter
m³ = cubic meter
m² = square meter
t = metric ton (1000 kilograms)
ea = each
LS = lump sum
HA = hectare

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01200

GENERAL REQUIREMENTS

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 PROJECT FACILITIES
 - 1.3.1 Construction Signs
 - 1.3.2 Bulletin Board
 - 1.3.3 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' 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
 - 3.9.5.2 Disposal Site
 - 3.9.5.3 Spill Reporting
 - 3.9.5.4 Environmental Assessment Requirement
 - 3.9.6 Restrictions
 - 3.9.6.1 Representatives of Other Agencies

- 3.9.6.2 Traffic Control Plan
- 3.9.6.2 Existing Roads
- 3.9.6.3 Access and Haul Roads
- 3.9.6.4 Public and Private Access Roads
- 3.9.6.5 Maintenance of Roads
- 3.9.6.6 Traffic Safety
- 3.9.6.7 Rock and Gravel
- 3.9.6.8 Cooperation with Others
- 3.9.6.9 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
 - 3.10.1 CONTRACTOR SAFETY PERSONNEL REQUIREMENT
 - 3.10.1.1 General
 - 3.10.1.2 Qualifications for Safety and Health Professional(s)
 - 3.10.1.3 Qualification for Safety and Health Technicians
 - 3.10.1.4 Names and Duties
- 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 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15, 31 OCT 89)
- 3.15 REQUIRED INSURANCE
- 3.16 SPECIAL CONSTRUCTION REQUIREMENTS
 - 3.16.1 Project Limits
 - 3.16.2 Order of Channel Construction
 - 3.16.2.1 Storm Runoff
 - 3.16.3 DISPOSAL OF EXCESS EXCAVATED MATERIALS
 - 3.16.4 Durango Drive Phasing
 - 3.16.4.1 Construction Coordination Rhodes Ranch Sewer and Durango Drive Improvementss
 - 3.16.4.2 Construction Coordination for Fill in Durango Drive
 - 3.16.4.3 Construction Coordination with Clark County Warm Springs Durango Drive Project
 - 3.16.4.4 Construction Coordination Rhodes Ranch Landscaping and Durango Drive Median Landscapingg
 - 3.16.4.5 Construction Coordination for Overburden on Flood Easement on Westside of Durango Drive, between Station 37+21.439 through Station 43+30.730..
 - 3.16.4.6 Construction Coordination for School Bus Stop
 - 3.16.4.7 Construction Coordination for Rhodes Ranch Entrance and Exit
 - 3.16.4.7 Construction Coordination for Beltway Frontage Road Temporary Detourr
 - 3.16.5 Material Processing
 - 3.16.6 Waterline at Sta. 47+36

- 3.16.7 Durango Drive Improvements
- 3.16.8 Inlet Structure Phased Construction
- 3.16.9 Existing and New Utility Lines
 - 3.16.9.1 Gas Utility Lines
 - 3.16.9.2 Telephone Lines
 - 3.16.9.3 Nevada Power
- 3.16.10 Active Side Drains/Storm Flows
- 3.16.11 Phasing between Shelbourne and Windmill
 - 3.16.11.1 Residential Access
 - 3.16.11.2 Construction Access for Auburn Hills in Rhodes Ranch
 - 3.16.11.3 Construction and Local Access for Property at Northeast Corner of Windmill and Durango
 - 3.16.11.4 Expiring Temporary Construction Easement (TCE) on West Side from Sta. 45+35.38 through Sta. 43+30.93
- 3.16.12 Salvaged Riprap from Beltway
- 3.16.13 Station 25+19 through Station 16+40
 - 3.16.13.1 Loughton Powers Property Temporary Construction Easement (TCE) East Side of Channel Between Sta. 20+78.58 through 18+73.188
- 3.16.14 Sewerline between Sta 48+40 through 30+18.420
- 3.17 CONTRACTOR'S SURVEYS
 - 3.17.1 Survey Data
 - 3.17.2 Survey Data Standards
 - 3.17.3 Positioning System
 - 3.17.4 Survey Firm Acceptance
 - 3.17.5 Data Processing

-- 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.

ASME INTERNATIONAL (ASME)

ASME B18.2.1 (1996) Square and Hex Bolts and Screws, Inch Series

ASME B18.2.2 (1987; R 1999) Square and Hex Nuts

ASTM INTERNATIONAL (ASTM)

ASTM F 1667 (2002) Driven Fasteners: Nails, Spikes, and Staples

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST PS 20 (1999) American Softwood Lumber Standards

U.S. DEPARTMENT OF COMMERCE (DOC)

PS1 (1995) Construction and Industrial Plywood

MASTER PAINTERS INSTITUTE (MPI)

MPI 5 (Jan 2003) Exterior Alkyd Wood Primer

MPI 10 (Jan 2003) Exterior Latex, Flat

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The "RE" designates that the Resident Office will review the submittal for the Government. Submit the following in accordance with Section 01330, SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Topographic Surveyor; G, RE.

The Topographic Surveyor firm selected by the Contractor must be approved by the Contracting Officer prior to performing surveys for this contract.

1.3 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.

1.3.1 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.

1.3.2 Bulletin Board

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

1.3.3 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

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

2.1.1.2 Plywood

PS1, grade A-C, Group 1, exterior type.

2.1.1.3 Bolts, Nuts and Nails

Bolts shall conform to ASME B18.2.1, nuts shall conform to ASME B18.2.2, and nails shall conform to ASTM F 1667.

2.1.1.4 Paints and Oils

Paints shall conform to MPI 5 for primer and MPI 10 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 02300 EARTHWORK 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.

3.9.5.2 Disposal Site

There is no off project site disposal site for non-BLM Lands excess satisfactory excavated materials. See Paragraph DISPOSAL OF EXCESS EXCAVATED MATERIALS.

3.9.5.3 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.

3.9.5.4 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 South of Shelbourne Avenue 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 immediately South of Shelbourne Avenue on BLM Lands so that a biological monitor shall be required to walk immediately in front of the Contractor's 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.

3.9.6.2 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.

3.9.6.3 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.

3.9.6.4 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.

3.9.6.5 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.

3.9.6.6 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 DOT D-6.1.

3.9.6.7 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.

3.9.6.8 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.

3.9.6.9 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.

3.10.1 CONTRACTOR SAFETY PERSONNEL REQUIREMENT

3.10.1.1 General

Full-time, on-site, safety coverage by Contractor shall be required at all times during this contract. The Contractor shall employ at the project site to cover all hours of work at least one Safety and Occupational Health Technician per shift, to manage the Contractor's accident prevention program. In addition, the Contractor shall have one Safety and Occupational Health Professional to manage the overall Safety program. The principal safety person (the Safety Professional) shall report to and work directly for the Contractors on-site top manager, higher level official, or corporate safety office. The Safety and Health staff shall have the authority to take immediate steps to correct unsafe or unhealthful conditions. The presence of a Safety and Health person will not abrogate safety responsibilities of other personnel. The Safety and Health person shall be assigned no other duties.

3.10.1.2 Qualifications for Safety and Health Professional(s)

- a. Shall have a degree in engineering or safety in at least a four year program from an accredited school and in addition, shall have been engaged in safety and occupational health for at least two (2) years, no time being credited to these two (2) years unless at least fifty (50) percent of the time each year was devoted to safety and occupational health; or
- b. Shall have legal registration as a Professional Engineer, Certified Safety Professional, or a Certified Safety Manager, and, in addition, shall have been engaged in safety and occupational health for at least one (1) year, no time being credited to this one (1) year experience unless at least fifty (50) percent of the time was devoted to safety and occupational health; or
- c. Shall have degree other than that specified in (a) above and in addition, shall have been engaged in safety and occupational health for at least three (3) years, no time being credited to these three (3) years unless at least fifth (5) percent of the time each year was devoted to safety and occupational health; or
- d. In lieu of a degree, shall have been engaged in safety and occupational health for at least five (5) years, no time being credited to these five (5) years unless at least fifty (50) percent of the time each year was devoted to safety and occupational health.
- e. First aid work is not creditable experience.

3.10.1.3 Qualification for Safety and Health Technicians

- a. A bachelors degree in safety or an associated discipline and currently employed in a safety position; or
- b. An associate degree in Safety or an associated discipline and currently experience in Safety, and currently employed in a safety position; or
- c. Five years field experience in safety or an associated discipline and currently employed in a safety position.
- d. First Aid work is not creditable experience.

3.10.1.4 Names and Duties

The name and qualifications of nominated safety persons shall be furnished to the Contracting Officer (in resume format) for acceptability. A functional description of duties shall be provided prior to the pre-work conference. In addition, a copy of a letter from an authorized official of the Contractor which describes the duties and authority of the safety professional, including delegating sufficient authority to stop work to immediately correct the unsafe or unhealthful conditions.

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

- a. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE: DEFAULT (FIXED PRICE CONSTRUCTION). In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:
 - (1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.
 - (2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.
- b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress

schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DAYS

Work Days Based on five (5) Day Work Week

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

- c. Upon 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 delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in 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).

3.15 REQUIRED INSURANCE

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

- a. General Public Liability insurance for bodily injury and property damage with minimum limits of \$1,000,000 combined single limit per occurrence and \$1,000,000 annual aggregate for bodily injury to or death, personal injury and property damage.
- b. Automobile Liability insurance for bodily injury and property damage with minimum limits of \$1,000,000 combined single limit for each occurrence and \$1,000,000 annual aggregate.
- c. Either Workman's Compensation or Employer's Liability insurance with a minimum limit of \$1,000,000. In every case the insurance coverage shall amount to at least the limits stated above. However, where the Financial Responsibility Compulsory Insurance Law of the State in which the installation is located requires higher limits, the Automobile Liability Insurance Policy should provide coverage of at least those limits. County of Clark, a political subdivision of the state of Nevada, 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.

3.16 SPECIAL CONSTRUCTION REQUIREMENTS

Construction of the Upper Blue Diamond Diversion Channel shall be constructed in phases as described herein. The majority of the project may be constructed at any time during this contract provided an overall satisfactory (and approved) channel construction joint plan that will demonstrate safe measures to be employed to protect new work from the various phasing restrictions described herein. The Contractor shall restrict his operation and adapt his construction schedule to accommodate the following:

3.16.1 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 Upper Blue Diamond 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 Right-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.

3.16.2 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.

3.16.2.1 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 (north to south), 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.

3.16.3 DISPOSAL OF EXCESS EXCAVATED MATERIALS

An estimated amount of excavated material originating on non-BLM Lands from this project is required to be imported onto BLM Land for this project, and this material to be imported onto BLM Land is not considered as excess excavated material. The Contractor shall certify in writing that the material is clean and free of hazardous materials in accordance with section 02300 EARTHWORK paragraph BLM IMPORT MATERIAL REQUIREMENTS prior to hauling satisfactory excavated material to BLM Property.

- A. For non BLM Property, non Rhodes Ranch property and non Loughton Powers Property : Satisfactory excavated materials not utilized as part of the construction shall be considered as satisfactory excess excavated materials and shall become the property of the Contractor and shall be removed from the project site at no additional cost to the Government. Materials characterized as unsatisfactory soil in accordance with Section 02300 EARTHWORK and materials designated as scrap shall become**

the property of the Contractor and shall be removed from the project site and disposed of according to paragraph UNSATISFACTORY AND SCRAP MATERIAL of this section at no additional cost to the Government. If the Contractor elects to temporarily stockpile material within the ROW and TCE, no additional money shall be provided to re-load and haul this material away from the project site. The Contractor shall indicate the approximate quantities of material he proposes to remove from the 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 which material is removed from the project site, and 48 hours in advance of any material removal from the project site which he proposes to do on Saturday, Sunday or legal holidays.

- B. For BLM Property : Material originating from BLM property will not be allowed to leave BLM property boundaries, with exception of existing construction and manmade debris and trash. All BLM material will be utilized for the various fills required on the BLM property. The BLM Lands are south of Sta. 47+38.620.
- C. For Rhodes Ranch Property :
 - 1. The overburden material located on Rhodes Ranch property from Station 43+30.730 through Station 37+21.439 may be utilized elsewhere in the project for various fill requirements excluding on BLM Property. This overburden material will not be utilized on BLM Lands because it is considered to be man made fill. Prior to use, the Rhodes Ranch overburden material shall be processed as necessary to meet the contract grading requirements for the intended use. Rhodes Ranch Property overburden material between Station 43+30.730 through Station 37+21.439 not utilized elsewhere within this project shall be spread evenly back on the Rhodes Ranch Property within the boundaries of the ROW and TCE between Station 43+30.730 through Station 37+35.580. Satisfactory excavated material from under the overburden may be processed and used elsewhere on the project provided necessary requirements are met. Satisfactory excess excavated material from under the overburden shall be disposed of in accordance with this section.
 - 2. The overburden material located on Rhodes Ranch property from Station 37+21.439 through Station 33+65.000 (Overburden Rhodes Ranch Entryway) will be placed back in over the backfilled RCB to the lines and grade (topography) equal to pre-excitation work. Prior to use, the overburden material shall be processed as necessary to meet the contract grading requirements for the intended use. This overburden material will not be utilized on BLM Lands because it is considered to be man made fill. Satisfactory excavated material from under the overburden may be processed and used elsewhere on the project provided necessary requirements are met. Satisfactory excess excavated material from under the overburden shall be disposed of in accordance with this section.
- D. For Loughton Powers Property : All Material originating from Loughton Powers property between Sta. 20+78.580 through Sta. 18+73.180 will not

be removed from Loughton Powers property boundaries. The Contractor shall place the excavated Loughton Powers Fill Material within the Loughton Powers property project ROW and TCE boundaries. This material will be processed as necessary and used as backfill for the portion of channel that passes through the Loughton Powers property. Excess excavated material shall be neatly graded level between Upper Blue Diamond Diversion Channel ROW and TCE on Loughton Powers property.

3.16.4 Durango Drive Phasing

The construction along Durango Drive shall be conducted in phases so as to minimize disruptions to merchants, developers, contractors, agencies and public. The Upper Blue Diamond Diversion Channel from Station 10+00.000 through Station 49+40.000 may be constructed at any time during this contract within the constraints identified elsewhere in these specifications and provided an overall satisfactory (and approved) channel construction joint plan is developed that will demonstrate safe measures to be employed to protect new work from the various phasing restrictions described herein. The portion of channel between Station 30+18.420 through Station 25+19.089 is currently being constructed by others and is tentatively scheduled to be completed by 01 January 2004.

3.16.4.1 Construction Coordination Rhodes Ranch Sewer and Durango Drive Improvementss

The Contractor shall coordinate with the contractor performing the Rhodes Ranch Sewer and Durango Drive improvements. This work is scheduled to be completed by 01 January 2004. Unless provided with approval from the Contracting Officer, the Contractor shall not interfere with the Improvements.

3.16.4.2 Construction Coordination for Fill in Durango Drive

The Contractor shall coordinate the fill work for Durango Drive with other contractors, developers and agencies.

3.16.4.3 Construction Coordination with Clark County Warm Springs Durango Drive Project

- A) For the portion of stockpiled area caused by Clark County Warm Springs Durango Drive Project, the Contractor shall survey the stockpiled material and inform the Contracting Officer of the quantity difference in cubic meters between the overburden grade and the existing topographic drawings on the east side of Durango Drive NORTH OF warm Springs prior to performance of earthwork.
- B) The Contractor shall coordinate construction related activities with the Clark County Warm Springs Durango Drive Project contractor.

3.16.4.4 Construction Coordination Rhodes Ranch Landscaping and Durango Drive Median Landscapingg

The Contractor shall coordinate the Rhodes Ranch Landscaping and Durango Drive Median Landscaping with others.

A) The Rhodes Ranch Landscaping (trees) will be removed and reinstalled by other contractor(s). Rhodes Ranch has been given a 90 calendar day notification of the tree relocation date by Clark County Public Works. The removal should be completed by 24 October 2003. The Contractor shall provide construction coordination with other contractor(s). Any remaining existing plants, grass and top soil shall be removed by and disposed by the channel contractor which shall include abandoned irrigation lines and landscape lighting components, unless otherwise directed by the Contracting Officer.

B) The Contractor shall reconnect and maintain any irrigation lines within the earthwork area that provide water from main feeds into irrigation lines for the Durango Drive median and for the Rhodes Ranch landscaping that were disturbed during earthwork procedures and or road detours.

C) Construction Coordination for Overburden on Flood Easement on Westside of Durango Drive, between Station 33+65.000 through Station 37+21.439.

Prior to earthwork, the Contractor shall survey the overburden site and provide the Contracting Officer with information as to the quantity of overburden material in cubic meters and the existing grading of the overburden. Measurement for overburden Rhodes Ranch Entryway will be made on the basis of the actual volume, in cubic meters, as follows, between Station 33+65.000 through Station 37+21.439.

The overburden Rhodes Ranch Entryway quantity shall be surveyed and computed based on the following. The survey shall capture the elevations of a plane 0.610 meters above the top of the reinforced concrete box structure along the overburden area as shown on drawing sheet C22, Channel Typical Section, "Sta. 33+65.000 to Sta. 37+21.439". This 0.610 elevation plane above the reinforced concrete box shall be extended level (same elevation) to the west edge of the TCE limits to create a bottom for the overburden template. This template shall include a 1:1 slope up to daylight at and within the west TCE limit. This bottom of overburden shall then be compared with the actual existing finish grade elevations for the same area to create a volume of overburden. Survey data and calculations shall be submitted to the Contracting Officer prior to removing any overburden.

- D) Nuisance and storm flows out of the Rhodes Ranch development shall not be blocked or otherwise stopped so that water ponds onto private property.
- E) Material under the overburden and excess material under the overburden shall be handled in accordance with Section 02300 EARTHWORK, paragraph DISPOSITION AND DISPOSAL OF EXCAVATED MATERIALS.
- F) Excess satisfactory overburden material shall be handled in accordance with paragraph DISPOSAL OF EXCESS EXCAVATED MATERIAL of this Section.

3.16.4.5 Construction Coordination for Overburden on Flood Easement on Westside of Durango Drive, between Station 37+21.439 through Station 43+30.730..

- A) Prior to earthwork, the Contractor shall survey the overburden site and provide the Contracting Officer with information as to the quantity of overburden material in cubic meters and the existing grading of the overburden. Measurement for overburden Rhodes Ranch will be made on the basis of the actual volume, in cubic meters, as follows, between Station 37+21.439 through Station 43+30.730.

The overburden Rhodes Ranch quantity shall be surveyed and computed based on the following. The survey shall capture the existing hinge point elevations along the east side of the overburden area as shown on drawing sheet C21, Channel Typical Section, "Sta. 37+21.439 to Sta. 43+30.73". These existing hinge point elevations shall be extended level (same elevation) to the west edge of the TCE limits to create a bottom for the overburden template. This template shall include a 1:1 slope up to daylight at and within the west TCE limit. This bottom of overburden shall then be compared with the actual existing finish grade elevations for the same area to create a volume of overburden. Survey data and calculations shall be submitted to the Contracting Officer prior to removing any overburden.

- B) Access to sewer line easements traveling through the Rhodes Ranch overburden area shall be maintained at all times. In addition, nuisance and storm flows out of the Rhodes Ranch development shall not be blocked or otherwise stopped so that water ponds onto private property.
- C) Material under the overburden and excess material under the overburden shall be handled in accordance with Section 02300 EARTHWORK, paragraph DISPOSITION AND DISPOSAL OF EXCAVATED MATERIALS.
- D) Excess satisfactory overburden material shall be handled in accordance with paragraph DISPOSAL OF EXCESS EXCAVATED MATERIAL of this Section.

3.16.4.6 Construction Coordination for School Bus Stop

The Contractor shall notify the Contracting Officer at least 14 calendar days prior to construction work through the school bus stop location.

3.16.4.7 Construction Coordination for Rhodes Ranch Entrance and Exit

The Contractor shall coordinate with Rhodes Ranch concerning the construction phasing for the Rhodes Ranch Entrance and Exit. In accordance with the D Drawings, one side of the Rhodes Entrance shall be maintained open at all times. The contractor shall close the north side first and completely improve that side to include new asphalt, curb and gutter, sidewalk, side drains, channel utility relocations, etc prior to installing the detour and signage for the south side entrance. Once the north side entrance is determined to be complete per the Contracting Officer, permission to proceed with the south side entrance shall be provided.

3.16.4.7 Construction Coordination for Beltway Frontage Road Temporary Detour

Contractor shall coordinate with Clark County Dept of Public Works, and Nevada Dept of Transportation for and during all construction aspects of work involving the Beltway Frontage Road Temporary Detour. Contractor shall not track any earthwork materials onto Beltway Frontage Road. Contractor shall at all times keep all work areas secured by means of fencing and locked gates when not being used for access. During times of construction operation involving access, a flagman/watchman shall be stationed at each open gate to ensure public non-accessability through said open gate. All project site construction traffic onto and off Beltway Frontage Road shall be coordinated with flagmen and Clark County approved traffic control plans.

- A) The RCB CHANNEL FRONTAGE ROAD shall not be started until the traffic has been safely detoured onto the new detour road (see drawing sheets D7 titled BLUE DIAMOND DIVERSION CHANNEL BELTWAY DETOUR CONSTRUCTION PLAN STATION 10+00 TO 19+00 and D8 titled BLUE DIAMOND DURANGO REACH DIVERSION CHANNEL FRONTAGE ROAD DETOUR PLAN CONSTRUCTION SIGNING & STRIPING. Detour signage shall be maintained through the completion of the RCB CHANNEL FRONTAGE ROAD and road asphalt replacement in accordance with drawing sheet D12 titled UPPER BLUE DIAMOND DIVERSION CHANNEL REMOVAL AND RECONSTRUCTION SOUTHERN BELTWAY EASTBOUND FRONTAGE ROAD. Once the traffic is detoured onto the detour alignment, the Contractor shall have 75 calendar days to complete the work from Sta 16+40 to Sta 15+70 to include excavation, channel construction, backfill, road improvements, guard rails and traffic markings.
- B) All work interior to the Beltway (Main Channel/Confluence Sta 15+70 to Sta 10+00, and Lateral Sta 12+33 to Sta 10+00 to include the RCB under the Frontage Road (Sta 16+40 to Sta 15+70, see also above), shall be completed by 1 Mar 04. This shall include asphalt paving, fencing and soil stabilization, and the reconstruction of the borrow site to include any crusher/processing equipment demobilization. No work or equipment shall be allowed to operate in the Beltway after 1 Mar 04 other than that approved or directed to by the Contracting Officer.

3.16.5 Material Processing

In the event that the Contractor chooses to utilize a crusher or mechanical screen to process oversized material from the excavation for use in fills, the crusher(s) or mechanical screen(s) shall be located only within the limits of the Contractors Staging areas and/or within the beltway borrow site.

3.16.6 Waterline at Sta. 47+36

The waterline at Sta. 47+36 shall be relocated so as not to disrupt service. Any temporary by pass waterlines installed for the purposes of this waterline relocation work shall be coordinated with the Clark County Department of Public Works and the Las Vegas Valley Water District, if approved. Water shall be maintained at all times so as not to disrupt

service. An additional waterline within the ROW of Shelbourne Avenue shall be protected in place by the Contractor.

3.16.7 Durango Drive Improvements

The Upper Blue Diamond Diversion Channel Contractor is notified that the Durango Drive Improvements (by others) is schedule to commence in April 2004. Durango Drive will be improved from Arby northwards to the Beltway Frontage Road. Hauling and construction operations shall be coordinated with the various contractors and agencies involved with the improvements to Durango Drive.

3.16.8 Inlet Structure Phased Construction

The Upper Blue Diamond Diversion Channel Inlet Structure shown on drawing sheet C1 shall be phase constructed with the following requirements.

- A) The Contractor shall adhere to Section 02910 NATIVE PLANT EXTRACTION, SALVAGE AND STORAGE, paragraph EXTRACTION TIME, which prevents the Contractor from performing any earthwork per Section 02300 EARTHWORK to be done until the plants are salvaged.
- B) As part of the phased construction, the Contractor shall not commence construction activites (to include excavation) for the reinforced concrete channel portion of Upper Blue Diamond Diversion Channel between Station 52+34.340 through 49+40.000 prior to the complete (Sta 49+40 to Sta 10+00) channel being ready and available to safely transport water downstream of Sta 49+40.000. The Contractor may proceed with the construction of the Sta 52+34.430 to Sta 49+40 reach prior to completion of the channel downstream of Sta 49+40 contingent upon the requirements included below.
- C) **The Contractor shall not construct any of the Turning Basin Improvements to include foundation preparation between Sta. 0+80 and Sta. 1+70 of Upper Blue Diamond Diversion Channel Inlet Embankment alignment shown on C1 until the entire Upper Blue Diamond Diversion Channel from Station 10+00.000 through Station 52+34.340 has been completed. If the Contractor so elects, construction for the Turning Basin Embankment may commence prior to downstream channel construction from embankment alignment Sta. 1+70 to Sta. 2+70. In the event that the Contractor elects to proceed with construction of the Upper Blue Diamond Channel from Sta 49+40 to Sta 52+34.340 prior to the channel being complete downstream of Sta 49+40, a temporary drainage plug approved by the Contracting Officer shall be installed at Sta 49+35 that will prevent storm waters from entering the portion of the channel downstream of Sta 49+35. This plug shall be designed, installed and removed at the Contractors expense and shall in no way damage any portion of the permanent channel to remain. In the event that a portion of the Turning Basin embankment alignment Sta. 1+70 to Sta. 2+70 and Upper Blue Diamond Channel Sta 57+34.340 to Sta 49+40.000 are completed to include the outlet works, additional temporary plugs shall be installed to prevent water from entering the downstream portion of uncompleted channel. The Contractor shall provide a temporary block of 95% compacted fill from the spillway invert slab to the top of spillway**

channel wall of the Upper Blue Diamond Diversion Channel between Station 52+00.000 through Station 51+50.000 until the Upper Blue Diamond Diversion Channel from Station 10+00.000 through Station 52+34.340 has been completed. The Contractor shall also include the prevention of water from entering the outlet tower. The Contractor may perform all other Upper Blue Diamond Diversion Channel Inlet Embankment work except as noted above in this paragraph at any time during the construction duration. Once the entire Upper Blue Diamond Diversion Channel from Station 10+00.000 through Station 52+34.340 has been completed for safe passage of storm waters, the Contractor shall construct the portion of Upper Blue Diamond Diversion Channel Inlet Structure Embankment between alignment Station 0+80.000 through alignment Station 1+70.000. Once work commences on Sta. 0+80 to Sta. 1+70 all plugs temporarily blocking the completed channel flow shall be removed in their entirety. Note that the portion of channel between Station 30+18.420 through Station 25+19.089 is being constructed by others.

3.16.9 Existing and New Utility Lines

There are numerous existing utility lines that will interface with the Upper Blue Diamond Diversion Channel or its Side Drains/Laterals. The Upper Blue Diamond Diversion Channel Contractor shall coordinate their work with these existing lines. Recognized interfaces include relocations, and supporting in place existing service(s). The Upper Blue Diamond Diversion Channel Contractor shall coordinate their channel work with these utility interfaces and allow the utility companies contractors and representatives reasonable access to the Upper Blue Diamond Diversion Channel TCE and ROW areas as required to complete their work. The Upper Blue Diamond Diversion Channel TCE and ROW limits are not intended to be reserved for the sole use by the Upper Blue Diamond Diversion Channel Contractor.

3.16.9.1 Gas Utility Lines

Numerous areas of the Upper Blue Diamond Diversion Channel parallel, cross or interface with existing gas lines. As identified by the design, the Upper Blue Diamond Diversion Channel Contractor shall protect in place, support in place and concrete encase these lines in accordance with the drawing sheets and specifications. Currently, there are no gas lines that are scheduled to be relocated. Affected gas lines shall be supported and protected by the Contractor concurrently with the mass excavation through the area where the gas utility line is located. The Upper Blue Diamond Diversion Channel Contractor shall expose and temporarily support/protect in place these gas lines that cross the Upper Blue Diamond Diversion Channel until the channel structure is completed in that area of crossing. The Contractor shall allow the gas company access to inspect these gas lines during and after the mass excavation and fill through these areas is completed, and shall ensure that proper notification coordination with the gas company has been made.

3.16.9.2 Telephone Lines

Numerous areas of the Upper Blue Diamond Diversion Channel and Laterals cross or interface with existing telephone lines. As identified by the

design, the Upper Blue Diamond Diversion Channel Contractor shall support in place and/or concrete encase these telephone lines in accordance with the drawing sheets and specifications. Currently, there are no telephone lines that are scheduled to be relocated by others. Telephone lines affected shall be supported and protected by the Contractor concurrently with the mass excavation through the area where the telephone line is located. The Upper Blue Diamond Diversion Channel Contractor shall expose and temporarily support/protect in place these telephone lines that cross the Upper Blue Diamond Diversion Channel until the channel structure is completed in that area of crossing. The Contractor shall allow the telephone company access to inspect these lines during and after the mass excavation and fill through these areas is completed, and shall ensure that proper notification/coordination with the telephone company has been made. Furthermore, the Government expects that the Contractor shall allow the telephone company a total of ten (10) working days to relocate any lines during and after the mass excavation through these areas is completed in the event the telephone company decides to relocate telephone lines. Existing conduits to be raised to facilitate the new channel beneath shall be fully coordinated with Sprint. The Contractor should anticipate cutting existing conduit and installing split sleeve conduit of the similar diameter and length required to complete the raising. Elongation of existing cables (release of slack) shall be fully coordinated with Sprint to allow the installation of the longer split sleeve conduit. Spare conduits may be cut and replaced after completion of the RCB subject to that below. All existing conduits for the telephone utility lines that which are temporarily disturbed by the Upper Blue Diamond Diversion Channel Contractor shall be reconnected, mandrelled and have the pull ropes re-installed by the Upper Blue Diamond Diversion Channel Contractor. Rigid steel (wrapped) conduits shall be utilized for all bends. Relocations by the utility owner does not include those utilities identified by the Upper Blue Diamond Diversion Channel design to be supported and protected in place and concrete encased by the Upper Blue Diamond Diversion Channel Contractor. The Contractor shall allow the telephone company access to inspect these telephone lines during and after the mass excavation and fill through these areas is completed, and shall ensure that proper notification coordination with the telephone company has been made.

3.16.9.3 Nevada Power

Numerous areas of the Upper Blue Diamond Diversion Channel and Laterals cross or interface (aerial and underground) with existing Nevada Power circuits/ductbanks. As identified by the design, the Upper Blue Diamond Diversion Channel Contractor shall coordinate their construction with support in place, or protection in place, and concrete encase requirements for Nevada Power interfaces. Currently, there are no power lines that are schedule to be relocated by others. Power lines affected shall be supported and protected by the Contractor concurrently with the mass excavation through the area where the power line is located. The Upper Blue Diamond Diversion Channel Contractor shall expose and temporarily support/protect in place these any power lines that cross the Upper Blue Diamond Diversion Channel until the channel structure is completed in that area of crossing. The Contractor shall allow the power company access to inspect these lines during and after the mass excavation and fill through these areas is completed, and shall ensure that proper notification

coordination with the power company has been made. Circuits/ductbanks to be relocated shall be fully coordinated with Nevada Power as described herein. Raising of existing circuits/ductbanks shall include the removal of concrete encasement, new split sleeve conduit, new concrete encasement and mandrelleing for spares and the full coordination of Nevada Power. Rigid steel (wrapped) conduit shall be utilized for all bends in new alignments. Furthermore, the Government expects that the Contractor shall allow Nevada Power a total of ten (10) working days to relocate any power lines during and after the mass excavation through these areas is completed in the event Nevada Power company decides to relocate power lines. The Upper Blue Diamond Diversion Channel Contractor shall schedule all Upper Blue Diamond Diversion Channel work so that these utility areas may be worked around until the services are relocated by others.

3.16.10 Active Side Drains/Storm Flows

The Upper Blue Diamond Diversion Channel will be constructed in and through existing residential and commercial neighborhoods. As a result, the Upper Blue Diamond Diversion Channel Contractor shall anticipate runoff into the channel and channel construction area(s) from both storm flows and nuisance flows (excessive irrigation). The Upper Blue Diamond Diversion Channel Contractor shall complete the new channel work by providing protection from these water flows to include pumping out of excavations or channels that are not free draining due to the many phases of work for this contract. Water shall not be allowed to pond within a concrete channel section (invert, walls and or roof) that is not free draining. Pumped water shall comply with the requirements of the Contractors Storm Water Prevention Permit. Active side drains include but are not limited to golf course drains, Nigro constructed channel side drains (from Sta. 30+18 through 25+19) Warm Springs Lateral (Clark County Warm Springs Durango Drive Project), Rhodes Ranch Lateral, Beltway Lateral, overflow swales, and side drain inlets.

3.16.11 Phasing between Shelbourne and Windmill

Phasing of channel construction is required between Shelbourne and Windmill to maintain access to two private residences, and to construction access and business access as indicated below. Prior to commencing work from Sta 48+40 and Sta 43+30, the Contractor shall submit their proposed construction phasing and resident/construction/business access plan for this reach to the Contracting Officer.

3.16.11.1 Residential Access

One resident is west of Durango on Shelbourne and the other is west of Durango on Mistral. Access to these two residences shall be provided along existing paved streets and/or through the Channel ROW/TCE areas at all times (24 hours per day), shall be well graded and include dust control. The Contractor shall phase and fully coordinate their construction with these two residences. As a minimum, resident access shall include an 3.353 meter (11 foot) wide well maintained travel way with turning radii that support that type of vehicles requiring access to these residences.

3.16.11.2 Construction Access for Auburn Hills in Rhodes Ranch

Within the limits of this projects boundaries, the Contractor shall maintain local access crossings near Shelbourne and Mistral for both local residential access and construction traffic access related to the Auburn Hills in Rhodes Ranch. The Contractor shall coordinate the phasing of channel work with the Developer.

3.16.11.3 Construction and Local Access for Property at Northeast Corner of Windmill and Durango

Construction is scheduled between the beginning of September 2003 through to the end of April 2004, with the business open during April 2004 and beyond. The Contractor shall coordinate access, within limits of the project boundaries, to this location with the business and developer/contractor.

3.16.11.4 Expiring Temporary Construction Easement (TCE) on West Side from Sta. 45+35.38 through Sta. 43+30.93

The Contractor shall complete construction activities and clean up the area between channel ROW and TCE from station 45+35.38 through station 43+30.93 on west side of channel prior to 31 December 2004. Station 45+35.38 is centerline of Mistral Avenue. Station 43+30.93 is centerline of Windmill.

3.16.12 Salvaged Riprap from Beltway

Salvaged rip rap from the Beltway shall be cleaned (no material less than 3 inches in size) and stockpiled adjacent to the existing channel just east of Sta 10+00 (main line channel). Rip rap stockpile shall be configured so as not to pond water and shall be a minimum 20 feet from the existing channel edge.

3.16.13 Station 25+19 through Station 16+40

All channel construction from Sta 25+19.089 to Sta 16+40 shall be completed with 240 calendar days of the contract notice to proceed. All work to include soil stabilzation, fencing, cable railing, asphalt and manhole utility markers shall be completed at this time so that work by others within this channel TCE/ROW may commence unimpeded by others.

3.16.13.1 Loughton Powers Property Temporary Construction Easement (TCE) East Side of Channel Between Sta. 20+78.58 through 18+73.188

The Contractor shall complete construction activities and clean up the area between channel ROW and TCE from station 20+78.58 through station 18+73.18 on east side of channel prior to 30 June 2004. Station 20+78.58 is centerline of Badura. Station 18+73.18 is centerline of Maule.

3.16.14 Sewerline between Sta 48+40 through 30+18.420

Sewerline work by others is required to be completed before excavation for the new channel can commence between Sta 48+40 and Sta 30+18.420. This new and relocated sewerline is not anticipated to be completed prior to 1 Jan 04. The Contractor shall not perform construction work between Sta.

47+38.62 through Sta. 30+18.420 until 01 January 2004, or as directed by the Contracting Officer. This date shall also include the use of Durango ROW for the satisfactory excavated material fill site from Robindale to Windmill.

3.17 CONTRACTOR'S SURVEYS

3.17.1 Survey Data

Reference is made to SECTION 00800: SPECIAL CONTRACT REQUIREMENTS, QUANTITY SURVEYS, ALTERNATE I, FAR 52.236-16 which requires payments based on surveys. Progress payments will be based upon Contractor's surveys. The Contractor's survey shall provide full coverage of the entire area for which progress payment is being submitted. It is further emphasized that survey data which does not meet all applicable requirements and quality assurance verifications will not constitute a valid request for payment. Contractor's surveys shall be performed electronically (automated) and the data shall be provided and submitted to the Government on an electronic media (IBM compatible, ASCII format) in delimited files of easting, northing, and depth (x,y,z), where the depth is indicated as positive if recorded above mean sea level. The first lines of the data file will list the information as follows:

- * Project Name: UPPER BLUE DIAMOND Diversion Channel; ENTIRE PROJECT SITE 2003
- * Surveyor's Name and Company Name
- * Area Surveyed
- * Type of Survey and Date of Survey (i.e. Pre-construction, MM/DD/YR)
- * Vertical Datum
- * Horizontal Datum

These first 6 lines will be preceded by an asterisk (*), which indicates a comment line.

For both the pre-construction and post construction surveys, three (3) copies of the survey plotted on paper will accompany the x,y,z data (electronic file) and all data shall be collected and plotted in metric units (meters).

3.17.2 Survey Data Standards

The Contractor's surveys for progress payment shall meet or exceed the survey standards listed in EM 1110-1-1005, Topographic Surveying for topographic surveys. Surveys shall be in the State Plane Coordinate System of 1983 - meters (SPCS 83), State of Nevada, and be performed by an independent survey contractor with at least three (3) years of experience in topographic surveying of land features and have either a current Land Surveyor's or a Professional Engineer's license, authorized to certify surveys in the State of Nevada. The Topographic Surveyor firm selected by the Contractor must be approved by the Contracting Officer prior to performing surveys for this contract.

3.17.3 Positioning System

It is required that surveys shall be conducted using an RTK or similar modern electronic surveying equipment using Differential Global Positioning System (DGPS) with positional accuracy equal to or exceeding the survey standards listed in EM 1110-1-1003 and EM 1110-1-1005.

3.17.4 Survey Firm Acceptance

For the Contracting Officer to approve the selected survey firm, the Contractor must provide documentation indicating that modern electronic surveying equipment will be used for the surveys to be performed as well as documentation verifying the experience of the operators using the equipment. Typical information that will be required, as a minimum, includes the name, model, and year of manufacture of the electronic equipment, and the manufacturer's stated accuracies, and capability of the equipment proposed for usage. The Contractor shall submit credentials/qualifications as evidence that qualified, experienced staff are available and will be used for the operation of the electronic positioning and surveying equipment.

3.17.5 Data Processing

The Contractor shall use a Data Processing System to map the survey data and calculate quantities. Reduced survey data shall then be imported into the Data Processing System where cross-sections are compared to fill templates and volume quantities are calculated. The software shall be capable of digital terrain modeling and shall produce, as a minimum, topographic survey sheets, cross section profiles, 3-dimensional area profiles, and quantity volume calculations using the Triangulated Irregular Network (TIN) method.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

- 1.1 REFERENCES (NOT USED)
- 1.2 CONTRACT PRICE AND PAYMENT
- 1.3 LUMP SUM PAYMENT ITEMS
- 1.4 UNIT PRICE PAYMENT ITEMS
- 1.5 TRAFFIC CONTROL (Bid Item 0001)
- 1.6 DIVERSION AND CONTROL OF WATER (Bid Item 0002).
- 1.7 CLEAR SITE AND REMOVE OBSTRUCTIONS (Bid Item 0003).
- 1.8 STRIP AND STOCKPILE TOPSOIL, BLM LANDS (Bid Item 0004)
- 1.9 EXCAVATION.
 - 1.9.1 EXCAVATION CHANNEL, NON BLM LAND (Bid Item 0005), EXCAVATION CHANNEL, BLM LAND (Bid Item 0006), EXCAVATION INLET STRUCTURE, BLM LAND (Bid Item 0007))
 - 1.9.1.1 Measurement
 - 1.9.1.2 Payment
 - 1.9.1.3 Excavation, Inlet Structure
 - 1.9.1.4 Excavation, Channel
 - 1.9.1.5 Subgrade or Foundation Preparation
 - 1.9.1.6 Unsatisfactory Soils
 - 1.9.1.7 Excavation for Structures
 - 1.9.1.8 Trenches
 - 1.9.1.9 Shoring
 - 1.9.1.10 Excavation for Utilities
- 1.10 FILLS
 - 1.10.1 Measurement.
 - 1.10.2 Payment.
 - 1.10.2.1 COMPACTED FILL, CHANNEL, NON BLM LAND (Bid Item 0008).
 - 1.10.2.2 COMPACTED FILL, CHANNEL, BLM LAND (Bid Item 0009).
 - 1.10.2.3 COMPACTED FILL, INLET STRUCTURE EMBANKMENT AND INVERT, BLM LAND (Bid Item 0010)
 - 1.10.2.4 MISCELLANEOUS FILL, INLET STRUCTURE EMBANKMENT AND INVERT, BLM LAND (Bid Item 0011)
 - 1.10.2.5 Fill or Backfill Around Structures.
 - 1.10.2.6 Trenches.
 - 1.10.2.7 Subgrade Preparation.
- 1.11 OVERBURDEN RHODES RANCH (Bid Item 0013).
 - 1.11.1 Measurement
 - 1.11.2 Payment
- 1.12 CONCRETE.
 - 1.12.1 Measurement.
 - 1.12.2 PAYMENT FOR CONCRETE ITEMS.
 - 1.12.2.1 CONCRETE, OPEN CHANNEL INVERT SLAB (Bid Item 0014).

- 1.12.2.2 CONCRETE, OPEN CHANNEL WALLS (Bid Item 0015).
- 1.12.2.3 Concrete, Channel Side Slope.
- 1.12.2.4 Concrete, Cut-off Wall.
- 1.12.2.5 Concrete, Transition
- 1.12.2.6 CONCRETE OVERFLOW STRUCTURE(S) (Bid Item 0016, 0017, 0018, 0019, 0102)
- 1.13 GROUTED RIPRAP (Bid Item 0020)
 - 1.13.1 Measurement.
 - 1.13.2 Payment.
- 1.14 REINFORCING STEEL (Bid Item 0021).
 - 1.14.1 Measurement.
 - 1.14.2 Payment.
- 1.15 AGGREGATE BASE COURSE (Bid Item 0022).
 - 1.15.1 Measurement.
 - 1.15.2 Payment.
- 1.16 ASPHALT CONCRETE PAVEMENT (Bid Item 0023).
 - 1.16.1 Measurement.
 - 1.16.2 Payment.
- 1.17 WEEPHOLE SYSTEM (Bid Item 0024).
- 1.18 RCB CHANNEL AND BELTWAY LATERAL CONFLUENCE STRUCTURE (Bid Item 0025).
- 1.19 CHANNEL AND A PORTION OF BELTWAY LATERAL STRUCTURE (Bid Item 0026).
- 1.20 RCB CHANNEL FRONTAGE ROAD (Bid Item 0027).
- 1.21 RCB CHANNEL TIBERTI NORTH (Bid Item 0028).
- 1.22 CHANNEL AND RHODES RANCH CONFLUENCE STRUCTURE (Bid Item 0029).
- 1.23 CHANNEL AND A PORTION OF RHODES RANCH LATERAL STRUCTURE (Bid Item 0030).
- 1.24 RHODES RANCH LATERAL (Bid Item 0031).
- 1.25 RHODES RANCH LATERAL END (Bid Item 0032).
- 1.26 RCB CHANNEL RHODES RANCH (Bid Item 0033).
- 1.27 RCB CHANNEL WINDMILL ROAD THROUGH SHELBOURNE AVE (Bid Item 0034).
- 1.28 INVERT ACCESS RAMP 1 (Bid Item 0035).
- 1.29 INVERT ACCESS RAMP 2 (Bid Item 0036).
- 1.30 INVERT ACCESS RAMP 3 (Bid Item 0037).
- 1.31 INLET STRUCTURE SOIL CEMENT ARMOR (Bid Item 0038)
 - 1.31.1 Measurement
 - 1.31.2 Payment
- 1.32 PORTLAND CEMENT FOR SOIL CEMENT (Bid Item 0039)
 - 1.32.1 Measurement
 - 1.32.2 Payment
- 1.33 POZZOLAN FOR SOIL CEMENT (Bid Item 0040)
 - 1.33.1 Measurement
 - 1.33.2 Payment
- 1.34 INLET STRUCTURE OUTLET RCB (Reinforced Concrete Box) Bid Item 0041)
- 1.35 INLET STRUCTURE OUTLET TOWER (Bid Item 0042)
- 1.36 SIDE DRAINS (Bid Items 0043, 0044, 0045, 0046, 0047, 0048, 0118, 0119, 0120, 0121, 0122).
- 1.37 MANHOLES FOR BOX CONDUITS, CULVERTS, AND LATERALS (Bid Item 0049).
- 1.38 ROAD DETOUR AT BELTWAY (Bid Item 0050).
- 1.39 EASTBOUND FRONTAGE ROAD REMOVAL AND RECONSTRUCTION (Bid Item 0051).
- 1.40 CHAIN LINK FENCE, 1.829 M HIGH, 9 GAGE (Bid Item 0052).
 - 1.40.1 Measurement.
 - 1.40.2 Payment.
- 1.41 POST AND CABLE RAILING (Bid Item 0053)

- 1.41.1 Measurement
- 1.41.2 Payment
- 1.42 DOUBLE SWING GATES (Bid Item 0054).
 - 1.42.1 Measurement
 - 1.42.2 Payment.
- 1.43 PRE-EMERGENT HERBICIDE AND PIGMENTED DUST PALLIATIVE/SOIL STABILIZER ON NON-REVEGETATED AREAS OF CHANNEL (Bid Item 0055)
 - 1.43.1 Measurement
 - 1.43.2 Payment
- 1.44 STATION MARKINGS (Bid Item 0056).
- 1.45 AS-BUILT DRAWINGS (Bid Item 0057).
 - 1.45.1 Measurement
 - 1.45.2 Payment
- 1.46 LADDER SYSTEMS (Bid Item 0058)
- 1.47 SINGLE SWING GATES, MANWAY, 1.000 x 1.829 (Bid Item 0113).
 - 1.47.1 Measurement
 - 1.47.2 Payment.
- 1.48 BASIN TRESPASS PREVENTION DEVICES - BOLLARDS (Bid Item 0060).
- 1.49 DURANGO DRIVE REMOVAL AND RECONSTRUCTION (Bid Item 0061)
- 1.50 PROVIDE PLANT STORAGE IRRIGATION DURING CONSTRUCTION (Bid Item 0062)
- 1.51 PROVIDE IRRIGATION FOR ONE YEAR AFTER CONSTRUCTION (Bid Item 0063)
- 1.52 ONE YEAR GUARANTEE ON LANDSCAPE WORK AT INLET STRUCTURE (Bid Item 0064)
- 1.53 TORTOISE FENCE, INLET STRUCTURE (Bid Item 0065)
 - 1.53.1 Measurement
 - 1.53.2 Payment
- 1.54 SALVAGE, STORE, AND MAINTAIN PLANTS (Bid Items 0066 - 0069)
 - 1.54.1 Measurement
 - 1.54.2 Payment
- 1.55 TRANSPLANT PLANT MATERIALS (Bid Items 0070 - 0073)
 - 1.55.1 Measurement
 - 1.55.2 Payment
- 1.56 PLACE TOPSOIL TO FINISH GRADE, DOWNSTREAM SURFACE INLET STRUCTURE EMBANKMENT (Bid Item 0074)
 - 1.56.1 Measurement
 - 1.56.2 Payment
- 1.57 SEEDING AND FERTILIZATION, DOWNSTREAM SURFACE INLET STRUCTURE EMBANKMENT (Bid Item 0075)
 - 1.57.1 Measurement
 - 1.57.2 Payment
- 1.58 PROVIDE BROWSE PROTECTION (Bid Item 0076)
- 1.59 SIMULATED DESERT VARNISH ROCK COLOR MITIGATION (Bid Item 0077)
 - 1.59.1 Measurement
 - 1.59.2 Payment
- 1.60 SOIL SAMPLING AND TESTING FOR FERTILITY (Bid Item 0078)
 - 1.60.1 Measurement
 - 1.60.2 Payment
- 1.61 PIGMENTED DUST PALLIATIVE/SOIL STABILIZER ONLY ON REVEGETATED AREAS (Bid Item 0079)
 - 1.61.1 Measurement
 - 1.61.2 Payment
- 1.62 PROVIDE CHANNEL EXCAVATION SHORING ON WEST SIDE OF EXCAVATION FROM STA. 35+57.644 TO STA. 35+02.853 AND STA. 34+86.656 TO STA.

- 34+40.000 TO PROTECT STREET IMPROVEMENTS (Bid Item 0080))
- 1.63 PROVIDE CHANNEL EXCAVATION SHORING ON WEST SIDE OF EXCAVATION FROM STA. 34+40.000 TO STA. 34+16.498 AND ON EAST SIDE OF EXCAVATION FROM STA. 34+30.000 TO STA. 33+02.481 TO PROTECT STREET AND LANDSCAPING IMPROVEMENTS (Bid Item 0081)1)
 - 1.64 RHODES RANCH ENTRY PHASE 1 DETOUR (Bid Item 0082).
 - 1.65 RHODES RANCH ENTRY PHASE 2 DETOUR (Bid Item 0083).
 - 1.66 RHODES RANCH ENTRY REMOVAL AND RECONSTRUCTION (Bid Item 0084).
 - 1.67 DURANGO DRIVE ROAD CLOSURE - ROBINDALE ROAD TO WIGWAM AVENUE (Bid Item 0085).
 - 1.68 RCB CHANNEL UNDER BELTWAY ON RAMP (Bid Item 0086).
 - 1.69 ORNAMENTAL METAL FENCING (Bid Item 0087)
 - 1.69.1 Measurement
 - 1.69.2 Payment
 - 1.70 ORNAMENTAL METAL FENCING GATES (Bid Item 0088).
 - 1.70.1 Measurement
 - 1.70.2 Payment.
 - 1.71 UTILITY CROSSING ITEMS (Bid Item 0089).
 - 1.72 OUTLET CONDUIT SIDE DRAIN STRUCTURE, STA. 51+03.000 RT (Bid Item 0090).
 - 1.73 1.829 M x 1.524 M SIDE DRAIN STRUCTURE, STA. 13+40.000 LT (Bid Item 0091).
 - 1.74 WALL TRANSITION STRUCTURE(S) (Bid Items 0092, 0093, 0094, 0095, 0096, 0097, 0098, 0099, 0100, 0107, 0111)
 - 1.75 UTILITY MARKERS (Bid Item 0101).
 - 1.75.1 Measurement
 - 1.75.2 Payment.
 - 1.76 ADJUST SEWER MANHOLE FRAMES AND COVERS (Bid Item 0103)
 - 1.77 RCB CHANNEL LOUGHTON POWERS (Bid Item 0104).
 - 1.78 RCB CHANNEL BADURA (Bid Item 0105).
 - 1.79 OVERBURDEN RHODES RANCH ENTRYWAY (Bid Item 0106).
 - 1.79.1 Measurement
 - 1.79.2 Payment
 - 1.80 PROTECT IN-PLACE ARLINGTON RANCH SEWER LINE (Bid Item 0108)
 - 1.81 ADJUST ARLINGTON RANCH SEWER MANHOLES (Bid Item 0109)
 - 1.82 CHAIN LINK FENCE, 1.219 M HIGH (Bid Item 0110).
 - 1.82.1 Measurement.
 - 1.82.2 Payment.
 - 1.83 RCB CHANNEL TIBERTI SOUTH (Bid Item 0112).
 - 1.84 SINGLE SWING GATES, 1.000 X 1.219 (Bid Item 0113).
 - 1.84.1 Measurement
 - 1.84.2 Payment.
 - 1.85 BELTWAY LATERAL TRANSITIONAL RCB STRUCTURE AT DURANGO DRIVE (Bid Item 0114).
 - 1.86 ORNAMENTAL METAL FENCE GATES, SINGLE SWING, 1.000 X 1.800 (Bid Item 0115).
 - 1.86.1 Measurement
 - 1.86.2 Payment.
 - 1.87 CHAIN LINK FENCE, 1.829 M HIGH, 11 GAGE (Bid Item 0116).
 - 1.87.1 Measurement.
 - 1.87.2 Payment.
 - 1.88 PLANT NURSERY AREA, TEMPORARY (Bid Item 0012).
 - 1.89 REMOVE, SALVAGE AND REPLACE FENCE (Bid Item 0123).
 - 1.89.1 Measurement.

1.89.2 Payment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section Table of Contents --

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 REFERENCES (NOT USED)

1.2 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 necessary to complete the work that is not specifically mentioned, such materials and work shall be considered incidental to all bid items. As stated in Contract Clause, SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, the word "provided" shall be understood to mean "furnished and installed" when used in this section or elsewhere in the technical sections.

1.3 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. Some of the lump sum payment items reference drawings and plans that utilize english units of measurements. Base bid items are limited to channel facilities North of Warm Spring's.

1.4 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. Some of the unit price payment items reference drawings and plans that utilize english units of measurements. Base bid items are limited to channel facilities North of Warm Spring's.

1.5 TRAFFIC CONTROL (Bid Item 0001)

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 temporary and permanent safety barriers; providing traffic warning and control signs and lighting; stripping; flag men as required, except where covered under other bid items.

1.6 DIVERSION AND CONTROL OF WATER (Bid Item 0002).

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.

1.7 CLEAR SITE AND REMOVE OBSTRUCTIONS (Bid Item 0003).

Payment for Clear Site and Remove Obstructions 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 for clearing, removal, replacement and restoration work specifically specified in other bid items throughout this project. 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 debris piles (consisting of construction debris and/or dumped soils, dumped gravels, dumped rocks and dumped boulders), including vehicle debris (vehicle bodies and/or vehicle parts) and appliance debris (whole and/or parts), and grubbing from within the Channel right-of-way and temporary construction easement; including removal of existing riprap rock and salvaging riprap rock for reuse unless it is paid for under another bid item, removal of existing filter fabric and or geotextile fabric under riprap in existing beltway channel, removal of existing grouted riprap rock as shown on the drawings; removal of existing concrete pavement and concrete curb and gutter and plantmix bituminous surface (pbs) as shown on the drawings; including sawcutting and removal of necessary portion of the existing precast 1.829 M x 1.524 M (6' x 5') RCB structure at approximate Sta. 13+40.000 (left side of channel looking upstream) to allow for placement of new channel and side drain structure; including sawcutting and removal of necessary portion (approximately 1.83 meters) of the existing Beltway Lateral Channel to Beltway Lateral Channel Station 12+33.13 to allow for placement of Beltway Lateral Transitional Structure at Durango Drive; removal, 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.

1.8 STRIP AND STOCKPILE TOPSOIL, BLM LANDS (Bid Item 0004)

Payment for strip and stockpile topsoil will be made at the applicable contract price per cubic meter for the basin site, which payment shall constitute full compensation for stripping and stockpiling specified surface soils, including clearing of grasses and weeds, debris and roots, after plant salvaging operations, as indicated in the specifications. The BLM lands are south of Sta. 47+38.620.

1.9 EXCAVATION.

1.9.1 EXCAVATION CHANNEL, NON BLM LAND (Bid Item 0005), EXCAVATION CHANNEL, BLM LAND (Bid Item 0006), EXCAVATION INLET STRUCTURE, BLM LAND (Bid Item 0007))

1.9.1.1 Measurement

A survey of the site shall be made by the Contractor 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. Measurement shall be based on the difference between surveyed original grade and the grade and slope of the theoretical cross sections indicated on the drawings. The actual slopes as excavated may be greater or less than those indicated or staked, depending on the materials excavated and methods used in performing the work, but such alterations shall not change the measurement for payment from the original lines as specified herein. The quantity of directed excavation necessary for the removal of unsatisfactory foundation material as specified shall be included in the measurement of the excavation where the unsatisfactory 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 Contractor has the option of using computer methods for quantity estimations, but all computer methods of quantity estimations shall be approved by the Contracting Officer. All excavation outside of excavation lines shown on the drawings will be considered as being for convenience of the Contractor. The BLM lands are south of Sta. 47+38.620.

1.9.1.2 Payment

Payment for excavation will be made at the applicable contract price, which payment shall constitute full compensation for excavation for the inlet structure embankment and spillway/transition structure foundations, inspection trenches, inlet structure invert, channels, roads and other areas as indicated on the drawings including shoring, blasting, rock excavation, and cemented alluvium excavation; shaping and trimming of areas to receive concrete or embankment material, soil cement, loading, stockpiling, crushing, processing, hauling, and dumping suitable materials for fills for the inlet structure embankments, channels, inlet structure spillway/ transition, and backfill for structures and pipes; and loading, stockpiling, hauling, placing and grading excavated materials in the graded basin areas. Excess BLM material shall be placed and graded at areas downstream of the basin on BLM property as directed by the Contracting Officer. Excess channel excavation material with certification documents shall be imported onto, placed, graded and compacted as required for areas of the basin on BLM property. Payment will not be included for excavation (including shoring) outside the excavation limits indicated on the drawings or staked in the field, and other earthwork requirements for which separate payments are provided. The BLM lands are south of Sta. 47+38.620.

1.9.1.3 Excavation, Inlet Structure

Payment for excavation, Inlet Structure will be made at the applicable

contract unit price per cubic meter, which payment shall constitute full compensation for excavation as indicated on the drawings including foundation preparation for any overexcavation for the inlet structure embankment. Payment for excavation, inlet structure shall not include the quantity included in clearing and grubbing and in strip and stockpile topsoil and other earthwork requirements for which separate payments are provided.

1.9.1.4 Excavation, Channel

Payment for excavation, channel will include excavations for spillway/transition and spillway/transition cutoff walls, and will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for excavation and haul and disposal of excess material. The BLM lands are south of Sta. 47+38.620.

1.9.1.5 Subgrade or Foundation Preparation

No separate payment will be made for subgrade or foundation preparation, including required shaping and cleaning of bedrock abutments and placement of mortar or concrete as necessary, and all costs in connection therewith shall be included in the contract prices for excavation or the items to which the work applies.

1.9.1.6 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.

1.9.1.7 Excavation for Structures

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

1.9.1.8 Trenches

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

1.9.1.9 Shoring

Except where otherwise directed within specific bid items, no separate payment will be made for shoring. The Contractor shall be responsible for method of construction and the use of shoring, stable slope cuts, or other trench safety requirements.

1.9.1.10 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.

1.10 FILLS

1.10.1 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. The Contractor has the option of using computer methods of quantity estimation, but all computer methods of quantity estimation shall be approved by the Contracting Officer.

1.10.2 Payment.

1.10.2.1 COMPACTED FILL, CHANNEL, NON BLM LAND (Bid Item 0008).

Payment for Compacted Fill, Channel, non BLM Land 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, including at disposal site shown on 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.

1.10.2.2 COMPACTED FILL, CHANNEL, BLM LAND (Bid Item 0009).

Payment for Compacted Fill, Channel, BLM Land 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, including processing of certification form for material import onto BLM Lands as necessary. 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. The BLM lands are south of Sta. 47+38.620.

1.10.2.3 COMPACTED FILL, INLET STRUCTURE EMBANKMENT AND INVERT, BLM LAND (Bid Item 0010)

Payment for Compacted Fill, Inlet Structure Embankment and Invert, BLM Land, will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for placing, shaping, grading, foundation preparation backfill, and compacting the fill, including settlement monuments and related work, complete, including processing of certification form for material import onto BLM Lands as necessary.

1.10.2.4 MISCELLANEOUS FILL, INLET STRUCTURE EMBANKMENT AND INVERT, BLM LAND (Bid Item 0011)

Payment for Miscellaneous Fill, Inlet Structure Embankment and Invert, BLM Land, will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for placing, shaping, and grading the fill, complete, including processing of certification form for material import onto BLM Lands as necessary.

1.10.2.5 Fill or Backfill Around 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.

1.10.2.6 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.

1.10.2.7 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.

NOTE : Requirements for Bid Item 0012 are in Paragraph 1.88

1.11 OVERBURDEN RHODES RANCH (Bid Item 0013).

1.11.1 Measurement

Measurement for overburden Rhodes Ranch will be made on the basis of the actual volume, in cubic meters, as follows, between Station 37+21.439 through Station 43+30.730.

The overburden Rhodes Ranch quantity shall be surveyed and computed based on the following. The survey shall capture the existing hinge point elevations along the east side of the overburden area as shown on drawing sheet C21, Channel Typical Section, "Sta. 37+21.439 to Sta. 43+30.73". These existing hinge point elevations shall be extended level (same elevation) to the west edge of the TCE limits to create a bottom for the overburden template. This template shall include a 1:1 slope up to daylight at and within the west TCE limit. This bottom of overburden shall then be compared with the actual existing finish grade elevations for the same area to create a volume of overburden. Survey data and calculations shall be submitted to the Contracting Officer prior to removing any overburden.

1.11.2 Payment

Payment for Overburden Rhodes Ranch will be made at the applicable contract price per cubic meter and includes handling of overburden material at identified Rhodes Ranch overburden site which includes overburden material on flood easement on West side of Durango Drive between station 37+21.439 through station 43+30.73 indicated herein; and shall be considered full payment for all work including surveying for quantity verification, stockpiling and grading to final grade lines, or hauling and processing to be used as compacted fill elsewhere excluding on BLM land, complete.

1.12 CONCRETE.

1.12.1 Measurement.

Measurement of concrete will be made on the basis of the actual volume, in cubic meters, 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.

1.12.2 PAYMENT FOR CONCRETE ITEMS.

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 including forming for wall variations at overflow structure locations, furnishing concrete, placing concrete, finishing concrete, curing concrete, 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.

1.12.2.1 CONCRETE, OPEN CHANNEL INVERT SLAB (Bid Item 0014).

Payment for concrete, open channel invert slab will include concrete placed in all open channel invert slab and for the inlet structure spillway invert slab, except for concrete inverts in structures for which payment is made on a lump sum basis, and payment will be made at the applicable contract unit price per cubic meter, which payment shall constitute full compensation for all concrete (including all necessary items described in Paragraph "PAYMENT FOR CONCRETE ITEMS" above) placed for the invert slab of the open channel and inlet structure spillway, keys, starter walls, and cut-off walls, complete.

1.12.2.2 CONCRETE, OPEN CHANNEL WALLS (Bid Item 0015).

Payment for concrete, open channel walls will include concrete placed in all open channel walls and for the inlet structure spillway walls, except

for concrete walls in structures for which payment is made on a lump sum basis, and payment will be made at the applicable contract price, which payment shall constitute full compensation for all concrete (including all necessary items described in Paragraph "PAYMENT FOR CONCRETE ITEMS" above) placed above the starter walls in the vertical walls of the open channel, complete.

1.12.2.3 Concrete, Channel Side Slope.

No separate payment will be made for concrete, channel side slope and all costs in connection therewith shall be included in the contract prices for immediate adjacent items to which the work applies.

1.12.2.4 Concrete, Cut-off Wall.

No separate payment will be made for concrete, cut-off walls and all costs in connection therewith shall be included in the contract prices for items to which the work applies.

1.12.2.5 Concrete, Transition

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

1.12.2.6 CONCRETE OVERFLOW STRUCTURE(S) (Bid Item 0016, 0017, 0018, 0019, 0102)

Payment for Concrete Overflow Structure(s) will be made at the applicable contract price, which payment shall constitute full compensation for all concrete (including all necessary items described in Paragraph "PAYMENT FOR CONCRETE ITEMS" above) placed for the concrete overflow structure, including furnishing and placing reinforcing steel, complete except earthwork. The Concrete Overflow Structure centerlines are located at Upper Blue Diamond Diversion Channel Stations 43+15.428, 40+68.000, 37+88.000, 31+04.220, and 17+04.885.

1.13 GROUTED RIPRAP (Bid Item 0020)

1.13.1 Measurement.

Measurement of Grouted Riprap will be made on the basis of the applicable contract unit price per cubic meter for the grouted riprap placed within the design lines of the grouted riprap structure as shown on the drawings. Measurement of grouted riprap placed against the sides of any excavation without the use of intervening forms will be made only within the design lines of the grouted riprap structure. No deductions will be made for rounded or beveled edges or space occupied by metalwork, nor voids or embedded items. Grouted riprap placed in items of work other than those specifically mentioned above, and grouted riprap and grout and riprap wasted or used for the convenience of the Contractor will not be included in measurement for payment.

1.13.2 Payment.

Payment for Grouted Riprap will be made at the applicable contract unit price, which payment shall constitute full compensation for obtaining and placing the grouted riprap and grout, complete including all incidentals.

1.14 REINFORCING STEEL (Bid Item 0021).

1.14.1 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 be converted to weights for the bar numbers listed by the unit weights per linear foot contained in ASTM 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.

1.14.2 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.

1.15 AGGREGATE BASE COURSE (Bid Item 0022).

1.15.1 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.

1.15.2 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.

1.16 ASPHALT CONCRETE PAVEMENT (Bid Item 0023).

1.16.1 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.

1.16.2 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.

1.17 WEEPHOLE SYSTEM (Bid Item 0024).

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.

1.18 RCB CHANNEL AND BELTWAY LATERAL CONFLUENCE STRUCTURE (Bid Item 0025).

Payment for RCB Channel and Beltway Lateral Confluence Structure will be made at the applicable contract price, which payment shall constitute full compensation for the RCB structure consisting of the Upper Blue Diamond Diversion Channel from Sta. 14+10.000 to Sta. 13+35.400, including confluence section T shown on drawing "S4", including invert transition section U shown on drawing "S5", and including 5.480 wide x 3.100 high box conduit, complete, except earthwork and except manholes; and including extended headwall shown on drawing "S3", complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; protect in place existing utilities; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.19 CHANNEL AND A PORTION OF BELTWAY LATERAL STRUCTURE (Bid Item 0026).

Payment for the Channel and a Portion of Beltway Lateral Structure will be made at the applicable contract price, which payment shall constitute full compensation for the structure consisting of the Upper Blue Diamond Diversion Channel from Sta. 14+55.422 to Sta. 14+10.000 and a Portion of Beltway Lateral from Sta. 10+00.000 to Sta. 10+45.312, including details of Section R and Section S shown on drawing "S5", and including details of Section P shown on drawing "S4", complete, except earthwork and except weepholes; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.20 RCB CHANNEL FRONTAGE ROAD (Bid Item 0027).

Payment for RCB Channel Frontage Road will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Frontage Road RCB Structure from Sta. 16+40.000 to Sta. 15+70.000, except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, including extended headwalls;

except temporary Frontage Road traffic detour and except installing new traffic barriers and maintaining existing traffic barriers on North side and South Side of channel at Frontage Road (Beltway), and except extra traffic control devices that will be left in place after Contractor leaves site on North side and South side of channel at Frontage Road (Beltway), complete as shown on the drawings except for post and cable railing and chain link fencing.

1.21 RCB CHANNEL TIBERTI NORTH (Bid Item 0028).

Payment for RCB Channel Tiberti North will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Tiberti North RCB Structure from Sta. 18+73.180 to Sta. 17+90.000, except earthwork, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, including headwall, complete as shown on the drawings except for chain link fencing and post and cable railing.

1.22 CHANNEL AND RHODES RANCH CONFLUENCE STRUCTURE (Bid Item 0029).

Payment for Channel and Rhodes Ranch Confluence Structure will be made at the applicable contract price, which payment shall constitute full compensation for the structure consisting of the Upper Blue Diamond Diversion Channel from Sta. 33+26.500 to Sta. 32+31.900, including details of Section S shown on drawing "S8", and including details of Section T shown on drawing "S9", except earthwork and except weepholes, complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.23 CHANNEL AND A PORTION OF RHODES RANCH LATERAL STRUCTURE (Bid Item 0030).

Payment for Channel and a portion of Rhodes Ranch Lateral Structure will be made at the applicable contract price, which payment shall constitute full compensation for the structure consisting of the Upper Blue Diamond Diversion Channel from Sta. 33+47.421 to Sta. 33+26.500 and a Portion of Rhodes Ranch Lateral from Sta. 10+00.000 to Sta. 10+20.000; except earthwork and except weepholes, complete, including details of Section R shown on drawing "S9"; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.24 RHODES RANCH LATERAL (Bid Item 0031).

Payment for Rhodes Ranch Lateral will be made at the applicable contract price, which payment shall constitute full compensation for the Rhodes Ranch Lateral from Sta. 10+20.000 to Sta. 10+69.530; except earthwork and except weepholes, complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; protect in place existing utilities; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.25 RHODES RANCH LATERAL END (Bid Item 0032).

Payment for the Rhodes Ranch Lateral End will be made at the applicable contract price, which payment shall constitute full compensation for the Rhodes Ranch Lateral End from Sta. 10+78.830 to Sta. 10+69.530 including wingwalls and including riprap, except earthwork and except weepholes, complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.26 RCB CHANNEL RHODES RANCH (Bid Item 0033).

Payment for RCB Channel Rhodes Ranch will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Rhodes Ranch RCB Structure from Sta. 37+35.580 to Sta. 33+65.000, except earthwork and except manholes, complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, including extended headwalls, complete, as shown on the drawings except for post and cable railing and chain link fencing.

1.27 RCB CHANNEL WINDMILL ROAD THROUGH SHELBOURNE AVE (Bid Item 0034).

Payment for RCB Channel Windmill Road through Shelbourne Ave will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Windmill Road through Shelbourne Ave RCB Structure from Sta. 48+40.000 to Sta. 43+30.730, except earthwork and except manholes, complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, including extended headwalls, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.28 INVERT ACCESS RAMP 1 (Bid Item 0035).

Payment for Invert Access Ramp 1 also includes the adjacent open channel from Sta. 17+66.000 to Sta. 16+99.919. 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 and except weepholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; including pipe access gate installed at top of access ramp to restrict vehicle access into channel invert and all appurtenances, including painting of pipe access gate; and all incidentals, including padlocks, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.29 INVERT ACCESS RAMP 2 (Bid Item 0036).

Payment for Invert Access Ramp 2, also includes the adjacent open channel from Sta. 31+23.949 to Sta. 30+58.000. 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 and except

weepholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; including pipe access gate installed at top of access ramp to restrict vehicle access into channel invert and all appurtenances, including painting of pipe access gate; and all incidentals, including padlocks, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.30 INVERT ACCESS RAMP 3 (Bid Item 0037).

Payment for Invert Access Ramp 3, also includes the adjacent open channel from Sta. 50+57.231 to Sta. 49+93.000. 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 and except weepholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; including pipe access gate installed at top of access ramp to restrict vehicle access into channel invert and all appurtenances, including painting of pipe access gate; and all incidentals, including padlocks, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.31 INLET STRUCTURE SOIL CEMENT ARMOR (Bid Item 0038)

1.31.1 Measurement

Measurement of soil cement will be made on the basis of actual cubic meters of soil cement placed within the lines and grades indicated on the drawings and specifications, excluding the quantity placed in the test section.

1.31.2 Payment

Payment for soil cement will be made at the applicable contract price, which payment shall constitute full compensation for the soil cement including all materials (except portland cement and pozzolan for which separate payments are provided), costs for test section, cost to develop all soil cement mix designs, formwork, batching, hauling, placing, compacting, finishing, curing and all equipment and tools to complete the soil cement in place. Embedded items shall be included in the cost of the soil cement except when other payment is specifically provided.

1.32 PORTLAND CEMENT FOR SOIL CEMENT (Bid Item 0039)

1.32.1 Measurement

Quantity of portland cement for soil cement to be paid for will be the number of metric tonnes (1,000 kilograms) of portland cement used for soil cement unless specifically excepted, wasted or used in the soil cement test section or for all soil cement mix designs or used for the convenience of the Contractor. The quantity to be paid for will be determined by multiplying the approved weight of portland cement in kilograms per cubic meter of soil cement by the number of accepted cubic meters of soil cement placed within the lines and grades indicated on the drawings and dividing by 1,000.

1.32.2 Payment

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

1.33 POZZOLAN FOR SOIL CEMENT (Bid Item 0040)

1.33.1 Measurement

Quantity of pozzolan for soil cement to be paid for will be the number of metric tonnes (1,000 kilograms) of pozzolan used for soil cement unless specifically excepted, wasted, or used in the soil cement test section or for all soil cement mix designs or used for the convenience of the Contractor. The quantity to be paid for will be determined by multiplying the approved weight of pozzolan in kilograms per cubic meters of soil cement by the number of accepted cubic meters of soil cement placed within the lines and grades indicated on the drawings and dividing by 1,000.

1.33.2 Payment

Payments for pozzolan for soil cement will be made at the applicable contract price, which payment shall constitute full compensation for furnishing the pozzolan, complete. No payment will be made for pozzolan used for structures for which separate payment is provided.

1.34 INLET STRUCTURE OUTLET RCB (Reinforced Concrete Box) Bid Item 0041)

Payment for Inlet Structure Outlet RCB will be made at the applicable contract lump sum price for the size and reach of box specified, which payment shall constitute full compensation for RCB and headwalls including earthwork, complete, including: furnishing and placing reinforcing steel; furnishing and placing, finishing and curing concrete, headwalls and manholes on outlet conduits; furnishing and placing plywood plugs; and all incidentals, complete as shown on the drawings, except for manholes and ladder systems and outlet conduit side drain connection which have separate bid items. Inlet Structure Basin Outlet Conduit RCB shall be 0.914 m x 0.914 m from Station 11+45.390 to Station 10+01.000.

1.35 INLET STRUCTURE OUTLET TOWER (Bid Item 0042)

Payment for the Inlet Structure Outlet Tower will be made at the applicable contract price, which payment shall constitute full compensation for the outlet tower structure, complete, including excavation and compacted fill; furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; furnishing and placing galvanized steel grating; furnishing and placing 76 diameter PVC pipe; and all incidentals.

1.36 SIDE DRAINS (Bid Items 0043, 0044, 0045, 0046, 0047, 0048, 0118, 0119, 0120, 0121, **0122**).

Payment for the various side drains 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, except earthwork; furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete for the side drain junction structures and inlet structure; furnishing and placing all lengths of concrete pipe as shown on the "C" drawings, fittings and end sections and concrete thrust blocks; and placing temporary pipe barriers (plugs) for stub-outs as necessary. 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.

1.37 MANHOLES FOR BOX CONDUITS, CULVERTS, AND LATERALS (Bid Item 0049).

Payment for Manholes for Box Conduits, Culverts, and Laterals will be paid for according to the applicable contract lump sum price including, excavation, backfill and appurtenances complete and in place, except for ladder systems. No extra payment will be made for pipe fittings required to make connections to manholes.

1.38 ROAD DETOUR AT BELTWAY (Bid Item 0050).

Payment for Road Detours at Beltway will be made at the applicable contract lump sum price, and shall be considered full payment for all work including: remove and salvage chain link fence; remove and salvage riprap in fill area; roadway embankment fill including all earthwork and provision of borrow materials, including pre and post surveys of the borrow area, including costs associated with embankment material for detour road may be borrowed from the area immediately north, when the detour road is removed, the Contractor shall restore the borrow area to the grades existing prior to construction; construct v-ditch along toe of slope to provide positive drainage, riprap protect the embankment slope; type II aggregate base and related work; 63 mm (2-1/2 inch) plantmix bituminous surface (PBS) and related work, with sawcut and match existing at both ends; portable precast concrete barrier rails; ground mounted construction signs (10 signs); type 1 lane line (paint); 150 mm (6-inch) wide white painted edge line; flag men as required; and removal of detour roadway embankment and appurtenances and restoration of Frontage Road/Beltway site including PBS, signage, striping, fencing, and flagmen, complete as shown on drawing sheet D7 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, BELTWAY DETOUR CONSTRUCTION PLAN, STATION 10+00 TO 19+00 and on drawing sheet D8 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, FRONTAGE ROAD DETOUR PLAN, CONSTRUCTION SIGNING & STRIPING.

1.39 EASTBOUND FRONTAGE ROAD REMOVAL AND RECONSTRUCTION (Bid Item 0051).

Payment for Eastbound Frontage Road Removal and Reconstruction will be made at the applicable contract lump sum price, and shall be considered full payment for all work including: remove and salvage chain link fencing; remove and salvage galvanized guardrail; remove 150 mm (6-inch) asphalt surface including sawcuts; provide and install type II aggregate base as shown on drawing; provide and install 150 mm (6-inch) plantmix bituminous surface including primecoat and tackcoat; construct galvanized guardrail per NDOT Standard Drawings; restore pavement markings; except earthwork which is covered under separate bid item, complete as shown on drawing sheet D12 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, REMOVAL AND

RECONSTRUCTION, SOUTHERN BELTWAY EASTBOUND FRONTAGE ROAD.

1.40 CHAIN LINK FENCE, 1.829 M HIGH, 9 GAGE (Bid Item 0052).

1.40.1 Measurement.

Measurement of chain link fence, 1.829 M High, 9 Gage will be by the linear meters of chain link fence, 1.829 M high, 9 Gage, constructed as shown on the drawings.

1.40.2 Payment.

Payment for Chain Link Fence, 1.829 M High, 9 Gage, 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, concrete, grounding, and all incidentals, complete as shown on the drawings.

1.41 POST AND CABLE RAILING (Bid Item 0053)

1.41.1 Measurement

Measurement of post and cable railing will be by the linear meter, measured from end to end, of railing installed as shown on the drawings.

1.41.2 Payment

Payment for post and cable railing will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for railing, including posts, cable, safety chain gates, anchor plate, bolts, and other galvanized appurtenances, fabrication, grout or dry pack, including painting of posts on non-Rhodes Ranch property and including painting of posts on Rhodes Ranch property to match ornamental fence paint color, and all incidentals, including padlocks, complete.

1.42 DOUBLE SWING GATES (Bid Item 0054).

1.42.1 Measurement

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

1.42.2 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, concrete, stops and padlocks, and all incidentals, complete, as shown on the drawings.

1.43 PRE-EMERGENT HERBICIDE AND PIGMENTED DUST PALLIATIVE/SOIL STABILIZER ON NON-REVEGETATED AREAS OF CHANNEL (Bid Item 0055))

1.43.1 Measurement

Measurement of pre-emergent herbicide and pigmented dust palliative/soil stabilizer will be made on the basis of the actual area in hectares of areas treated with pre-emergent herbicide and pigmented dust palliative/soil stabilizer used for disturbed areas that will not be revegetated as indicated or directed.

1.43.2 Payment

Payment for pre-emergent herbicide and pigmented dust palliative/soil stabilizer will be at the applicable contract unit price per hectare, which payment shall constitute full compensation including furnishing materials, processing, and application, complete in place.

1.44 STATION MARKINGS (Bid Item 0056).

Payment for Station Markings will be made at the applicable contract lump sum price, which shall be considered full payment for preparation, paint and marking, equipment and labor.

1.45 AS-BUILT DRAWINGS (Bid Item 0057).

1.45.1 Measurement

Measurement shall be made on a lump sum basis.

1.45.2 Payment

Payment for As-Built Drawings will be made at the applicable contract price, which payment shall constitute full compensation for furnishing all labor, material, and equipment complete in place for the complete set of as-built drawings, including electronic MicroStation SE or MicroStation J "DGN" file format and PEN FILES/TABLES on Compact Disk, indicating installation of work items not installed according to the contract drawings.

1.46 LADDER SYSTEMS (Bid Item 0058)

Payment for Ladder Systems will be made at the applicable contract lump sum price for installation of all channel access ladders, including access ladders for Manholes for Box Conduits. The contract price for ladder system shall be considered full payment for fabrication, assembly fittings, finishing, paint and marking, installation of ladder steps, and all equipment, labor and fittings.

1.47 SINGLE SWING GATES, MANWAY, 1.000 x 1.829 (Bid Item 0113).

1.47.1 Measurement

Measurement of single swing gates, manway 1.000 x 1.829 will be the number of single swing gates, manway 1.000 x 1.829 acceptably installed.

1.47.2 Payment.

Payment for single swing gates, manway 1.000 x 1.829 will be made at the applicable contract price, which payment shall constitute full compensation for fabricating and installing the single swing gates, manway 1.000 x 1.829, complete, including posts with caps, chain link fabric, frame members, tension bands, truss rods, stretcher bars, wire ties, truss wire, sleeves, hinges, grout, padlocks, and all incidentals, complete, as shown on the drawings.

1.48 BASIN TRESPASS PREVENTION DEVICES - BOLLARDS (Bid Item 0060).

Payment for trespass prevention devices will be made at the applicable lump sum contract price, which payment shall constitute full compensation for trespass prevention devices, including concrete filled bollards and foundation caissons, all associated fabrication, connections including welding, sleeves, lock assemblies, concrete and/or grout and/or drypack, surface preparation and painting, grounding, and all incidentals, including stops and padlocks, complete as shown on the drawings.

1.49 DURANGO DRIVE REMOVAL AND RECONSTRUCTION (Bid Item 0061)

Payment for Durango Drive Removal and Reconstruction will be made at the applicable contract lump sum price, and shall be considered full payment for all work including; remove 50 mm (2-inch) asphalt surface; install roadway embankment fill; install type II aggregate base; new 63 mm (2 1/2-inch) plantmix bituminous surface including sawcut; adjust water valve covers (13 each); and adjust sanitary sewer manhole covers (9 each, not including Arlington Ranch Sewer Manhole adjustments which are included in another bid item), complete, as shown on drawing sheets D14 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, REMOVALS AND RELOCATIONS, DURANGO DRIVE, D15 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, ROADWAY RECONSTRUCTION PLAN, DURANGO DRIVE STA. -7+50 TO STA. 4+00, D16 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, ROADWAY RECONSTRUCTION PLAN, DURANGO DRIVE STA. 4+00 TO STA. 15+00, including coordination and phasing costs required between Contractor with Rhodes Ranch relocated sewer and Durango roadway improvements related work as shown on Drawings D17 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, ROADWAY RECONSTRUCTION PLAN, DURANGO DRIVE STA. 15+00 TO STA. 26+00, and D18 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, ROADWAY RECONSTRUCTION PLAN, DURANGO DRIVE STA. 26+00 TO STA. 36+00.

1.50 PROVIDE PLANT STORAGE IRRIGATION DURING CONSTRUCTION (Bid Item 0062)

Payment for providing plant storage area irrigation during construction will be made at the applicable contract price, which payment shall constitute full compensation for furnishing water, labor and equipment to maintain plants as specified.

1.51 PROVIDE IRRIGATION FOR ONE YEAR AFTER CONSTRUCTION (Bid Item 0063)

Payment for providing irrigation for one year after construction will be made at the applicable contract price, which payment shall constitute full compensation for furnishing water, labor and necessary equipment to maintain plants placed for revegetation as specified.

1.52 ONE YEAR GUARANTEE ON LANDSCAPE WORK AT INLET STRUCTURE (Bid Item 0064)

Payment for providing a one year guarantee on landscape work will be made at the applicable contract price, which payment shall constitute full compensation for furnishing personnel to complete landscape work as specified, and providing required reports.

1.53 TORTOISE FENCE, INLET STRUCTURE (Bid Item 0065)

1.53.1 Measurement

Measurement of tortoise fence that is provided will be by the linear meter of tortoise fence constructed as shown on the drawings.

1.53.2 Payment

Payment for tortoise fence will be made at the applicable contract unit price per linear meter, which payment shall constitute full compensation for tortoise fence, including steel tee posts and all incidentals complete as shown on the drawings, and scheduling and coordination of the work to comply with Section 01200 GENERAL REQUIREMENTS, paragraph ENVIRONMENTAL ASSESSMENT REQUIREMENT. Payment shall also include complete removal of tortoise fence at the completion of this project.

1.54 SALVAGE, STORE, AND MAINTAIN PLANTS (Bid Items 0066 - 0069)

1.54.1 Measurement

Measurement for salvaging, storing, and maintaining plants will be the number of plants of each type specified, actually salvaged, stored and maintained in a healthy condition.

1.54.2 Payment

The accepted quantities of plants measured for salvaging, storing, and maintaining plants, will be paid at the applicable contract unit price per the type of plant, for plants actually salvaged, stored and maintained in a healthy condition. Such payment shall be full compensation for all the labor, materials, and incidentals necessary to complete the work, except transplanting plants and irrigation water to maintain the plants will be paid separately.

1.55 TRANSPLANT PLANT MATERIALS (Bid Items 0070 - 0073)

1.55.1 Measurement

Measurement for transplanting plant materials will be the number of plants of each type specified, actually planted on the project.

1.55.2 Payment

The accepted quantities of plants measured for transplanting plant materials will be paid at the applicable contract unit price per the type of plant, identified in each bid item and actually planted on the project. Such payment shall be full compensation for all the labor, materials, and

incidentals necessary to complete the work, except irrigation water to maintain the plants will be paid separately.

1.56 PLACE TOPSOIL TO FINISH GRADE, DOWNSTREAM SURFACE INLET STRUCTURE EMBANKMENT (Bid Item 0074)

1.56.1 Measurement

Measurement for placing topsoil to finished grade will be made on the basis of the cubic meters of material placed and graded to a depth of 203 millimeters over surfaces designated for revegetation treatment. Excess material from strip and stockpile for topsoil that is wasted or placed as miscellaneous fill will not be included for measurement under this item.

1.56.2 Payment

Payment for placing topsoil to finished grade will be at the applicable contract price per cubic meter, which payment shall constitute full compensation for materials, equipment, and labor.

1.57 SEEDING AND FERTILIZATION, DOWNSTREAM SURFACE INLET STRUCTURE EMBANKMENT (Bid Item 0075)

1.57.1 Measurement

Measurement for seeding and fertilization will be the number of hectares completed, applied at the specified seed and fertilizer rates in the designated areas, measured along the ground slope.

1.57.2 Payment

Payment for seeding and fertilization will be at the applicable contract price per hectares, which payment shall constitute full compensation for materials, equipment, and labor including tillage, amendments, and plant establishment.

1.58 PROVIDE BROWSE PROTECTION (Bid Item 0076)

Payment for providing browse protection will be made at the applicable contract price for each browse control device including equipment, supplies and labor.

1.59 SIMULATED DESERT VARNISH ROCK COLOR MITIGATION (Bid Item 0077)

1.59.1 Measurement

Measurement of simulated desert varnish rock color mitigation will be made on the basis of the actual area in hectares of exposed excavation, fill, and rock surfaces in the construction areas that are treated.

1.59.2 Payment

Payment for simulated desert varnish rock color mitigation will be at the applicable contract price per hectares, which payment shall constitute full

compensation for the simulated desert varnish rock color mitigation including furnishing materials, processing, hauling, and placing, complete in place.

1.60 SOIL SAMPLING AND TESTING FOR FERTILITY (Bid Item 0078)

1.60.1 Measurement

Measurement of soil sampling and testing for fertility will be made at the applicable contract unit price per each soil sample taken as shown on the drawings and tested for fertility.

1.60.2 Payment

Payment for soil sampling and testing for fertility will be made at the applicable contract price for each soil sample taken and tested, which payment shall constitute full compensation for materials, equipment, and labor.

1.61 PIGMENTED DUST PALLIATIVE/SOIL STABILIZER ONLY ON REVEGETATED AREAS (Bid Item 0079)

1.61.1 Measurement

Measurement of pigmented dust palliative/soil stabilizer will be made on the basis of the actual area in hectares used for revegetation as indicated or directed.

1.61.2 Payment

Payment for pigmented dust palliative/soil stabilizer will be at the applicable contract price per hectare, which payment shall constitute full compensation including grading, scarifying, furnishing materials, processing, hauling and applying, complete in place.

1.62 PROVIDE CHANNEL EXCAVATION SHORING ON WEST SIDE OF EXCAVATION FROM STA. 35+57.644 TO STA. 35+02.853 AND STA. 34+86.656 TO STA. 34+40.000 TO PROTECT STREET IMPROVEMENTS (Bid Item 0080))

Payment for providing excavation shoring along provide channel excavation shoring on west side of excavation from Sta. 35+57.644 to Sta. 35+02.853 and Sta. 34+86.656 to Sta. 34+40.000 to protect street improvements will be made at the applicable contract price, which payment shall constitute full compensation for furnishing shoring, labor and necessary equipment, for duration of related construction work in area, to protect street improvements as specified, and removal of said shoring when related work is completed.

1.63 PROVIDE CHANNEL EXCAVATION SHORING ON WEST SIDE OF EXCAVATION FROM STA. 34+40.000 TO STA. 34+16.498 AND ON EAST SIDE OF EXCAVATION FROM STA. 34+30.000 TO STA. 33+02.481 TO PROTECT STREET AND LANDSCAPING IMPROVEMENTS (Bid Item 0081)1)

Payment for providing channel excavation shoring on west side of excavation

from Sta. 34+40.000 to Sta. 34+16.498 and on east side of excavation from Sta. 34+30.000 to Sta. 33+02.481 to protect street and landscaping improvements will be made at the applicable contract price, which payment shall constitute full compensation for furnishing shoring, labor and necessary equipment, for duration of related construction work in area, to protect landscaping improvements as specified, and removal of said shoring when related work is completed.

1.64 RHODES RANCH ENTRY PHASE 1 DETOUR (Bid Item 0082).

Payment for Rhodes Ranch Entry Phase 1 Detour will be made at the applicable contract lump sum price, and shall be considered full payment for all work including: traffic drum with flasher, 24 inch solid white stop bar, ground mounted construction signs (7 signs); portable precast concrete barrier rails; type III barricade; and removal of Phase 1 detour items when no longer required, complete, except for earthwork, and as shown on drawing sheet D9 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, RHODES RANCH ENTRY, PHASE 1 & 2 DETOUR CONSTRUCTION PLAN.

1.65 RHODES RANCH ENTRY PHASE 2 DETOUR (Bid Item 0083).

Payment for Rhodes Ranch Entry Phase 2 Detour will be made at the applicable contract lump sum price, and shall be considered full payment for all work including: traffic drum with flasher, 24 inch solid white stop bar, ground mounted construction signs (10 signs); portable precast concrete barrier rails; removal of landscape median; temporary pavement patch; traffic drums with flashers; 4-inch double solid yellow centerline tape; 6-inch white edge line tape; 8-inch solid white edge line paint; 24-inch stop bar paint; type III barricade; replace raised median curb, complete, except for earthwork, and as shown on drawing sheet D9 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, RHODES RANCH ENTRY, PHASE 1 & 2 DETOUR CONSTRUCTION PLAN.

1.66 RHODES RANCH ENTRY REMOVAL AND RECONSTRUCTION (Bid Item 0084).

Payment for Rhodes Ranch Entry Removal and Reconstruction will be made at the applicable contract lump sum price, and shall be considered full payment for all work including: remove "L" type curb and gutter; remove "A" type curb; remove 100 mm (4-inch) concrete sidewalk; remove 50 mm (2-inch) asphalt surface; construct 3 each 6.56 m (20 foot) type CM drop inlet; construct 3 each 6.56 m (20 foot) type DM drop inlet; install 0.450 m (18-inch) RCP; install 0.610 m (24-inch) RCP; install 0.760 m (30-inch) RCP; construct "L" type curb & gutter; construct "A" type curb; construct 100 mm (4-inch) concrete sidewalk; install type II aggregate base; construct 2.4 m (8-foot) wide valley gutter; construct 50 mm (2-inch) plantmix bituminous surface permanent signing and striping, complete, as shown on the drawing sheet D13 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, REMOVAL AND RECONSTRUCTION, RHODES RANCH PARKWAY, and on drawing sheet D19 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, STORM DRAIN PROFILES.

1.67 DURANGO DRIVE ROAD CLOSURE - ROBINDALE ROAD TO WIGWAM AVENUE (Bid Item 0085).

Payment for Durango Drive Road Closure - Robindale Road to Wigwam Avenue

will be made at the applicable contract lump sum price, and shall be considered full payment for all work including: ground mounted construction signs (21 signs); type III barricade, provision of phased accessibility to existing residence and fire access crash gate off Shelbourne Avenue, complete, as shown on drawing sheet D10 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, ROAD CLOSURE PLAN, DURANGO DRIVE - ROBINDALE RD. TO WIGWAM AVE., including Contractor costs associated with having to provide construction access and coordination with Rhodes Ranch Contractor/Developer.

1.68 RCB CHANNEL UNDER BELTWAY ON RAMP (Bid Item 0086).

Payment for RCB Channel Under Beltway On Ramp will be made at the applicable contract price, which payment shall constitute full compensation for the RCB structure consisting of the Upper Blue Diamond Diversion Channel from Sta. 13+35.400 to Sta. 12+80.000, including 5.480 wide x 3.100 high box conduit, complete, except earthwork and except manholes; and including extended headwall shown on drawing "S3", complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; protect in place existing utilities; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing.

1.69 ORNAMENTAL METAL FENCING (Bid Item 0087)

1.69.1 Measurement

Measurement of ornamental metal fencing will be by the linear meter, measured from end to end, of ornamental metal fencing installed as shown on the drawings.

1.69.2 Payment

Payment for Ornamental Metal Fencing will be made at the applicable contract price per linear meter, which payment shall constitute full compensation for ornamental metal fencing, including posts with caps, rails, pickets, all associated fabrication, connections including bolting and/or welding, anchor bolt assemblies, base plate assemblies, grout or drypack, concrete, surface preparation and painting, grounding, including all earthwork for posts, and all incidentals, complete as shown on the drawings.

1.70 ORNAMENTAL METAL FENCING GATES (Bid Item 0088).

1.70.1 Measurement

Measurement of ornamental metal fencing gates will be the number of ornamental metal fencing gates acceptably installed.

1.70.2 Payment.

Payment for Ornamental Metal Fencing Gates will be made at the applicable contract price per each unit, which payment shall constitute full compensation for matching ornamental metal fencing gates, including posts with caps, rails, pickets, frame members, all associated fabrication,

connections including bolting and/or welding, anchor bolt assemblies, base plate assemblies, concrete and/or grout and/or drypack, hinges, surface preparation and painting, grounding, and all incidentals, including stops and padlocks, complete as shown on the drawings.

1.71 UTILITY CROSSING ITEMS (Bid Item 0089).

Payment for Utility Crossing Items will be made at the applicable contract lump sum price, and shall be considered full payment for all work including:

- A) excavation shoring for electrical vault Sta. 22+55 and excavation shoring for electrical vault Sta. 23+14 and protect in place underground electrical, telephone (fiber optic), and cable tv conduits at Sta. 20+74 as shown and indicated in note on drawing sheet D3 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 17+90, 20+74, AND 22+55;
- B) excavation shoring for electrical vault Sta. 33+25 and for Sta. 31+12 as shown and indicated in note on drawing sheet D4 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 33+25, 34+88, AND 37+24.4;
- C) support and concrete encase 305 mm (12-inch) waterline, electrical conduits, telephone conduits, and 150 mm (6-inch) gas line at Sta. 34+88 and protect sewer line in place at Sta. 37+24.4 as shown and indicated on drawing sheet D4 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 33+25, 34+88, AND 37+24.4;
- D) support and concrete encase telephone conduits and protect in place sewer line and manholes and waterline at Sta. 43+34 and protect in place sewer lines and manholes at Sta. 40+70 and Sta. 37+87 as shown and indicated on drawing sheet D5 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 37+87, 40+70, AND 43+34;
- E) support and concrete encase telephone conduits and protect in place high pressure gas line and waterline at Sta. 45+44 as shown and indicated on drawing sheet D6 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 45+44, 46+81, AND 47+36;
- F) support and concrete encase telephone conduits and protect in place high pressure gas line and waterline and sewer line at Sta. 46+81 as shown and indicated on drawing sheet D6 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 45+44, 46+81, AND 47+36;**
- G) support and concrete encase telephone conduits and protect in place high pressure gas line and waterline and sewer at approximate Sta. 47+00 as shown and indicated on drawing sheet D6 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 45+44, 46+81, AND 47+36;
- H) support and concrete encase telephone conduits and remove existing 200

mm (8-inch) PVC and install new 200 mm (8-inch) ductile iron pipe waterline with steel encasement and protect in place high pressure gas line and valve assembly and waterline and sewer at Sta. 47+36; including steel sleeve, restraints at all joints, elbows, plug and blow off, as shown and indicated on drawing sheet D6 titled UPPER BLUE DIAMOND DIVERSION CHANNEL, UTILITY CROSSING DETAILS, UBDDR STA. 45+44, 46+81, AND 47+36, complete.

1.72 OUTLET CONDUIT SIDE DRAIN STRUCTURE, STA. 51+03.000 RT (Bid Item 0090).

Payment for the outlet conduit side drain structure, sta. 51+03.000 right, will be made at the applicable contract price, which payment shall constitute full compensation for the side drain structure, complete, as shown on the drawings, except earthwork; furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete for the side drain junction structure and inlet structure; and placing temporary barriers (plugs) as necessary. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

1.73 1.829 M x 1.524 M SIDE DRAIN STRUCTURE, STA. 13+40.000 LT (Bid Item 0091).

Payment for the 1.829 M x 1.524 M side drain outlet structure, sta. 13+40.000 left, will be made at the applicable contract price, which payment shall constitute full compensation for the side drain structure, complete, as shown on the drawings, except earthwork; including sawcutting and removal of necessary portion of the existing precast 1.829 M x 1.524 M (6' x 5') RCB structure at STA. 13+40.000 (left side of channel looking upstream) to allow for placement of new channel and side drain structure; furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete for the side drain junction structure; furnishing and placing replacement cast in place RCB structure with all incidentals, and placing temporary barriers (plugs) as necessary. The earthwork included shall be only that earthwork which is located outside the limits of earthwork for which other payment is provided.

1.74 WALL TRANSITION STRUCTURE(S) (Bid Items 0092, 0093, 0094, 0095, 0096, 0097, 0098, 0099, 0100, 0107, 0111)

Payment for Wall Transition Structure(s) will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Wall Transition Structure(s) shown on the drawings and identified by Stationing in the respective bid items, including details shown on "S" sheet drawings, except earthwork and except weepholes, complete; including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete; and all incidentals, complete as shown on the drawings except for post and cable railing and chain link fencing. The Upper Blue Diamond Diversion Channel wall transition structures are identified from open channel invert and wall items for accounting purposes only. The Upper Blue Diamond Diversion Channel Wall Transition Structures are located at the following Stations -

STA. 49+00.000 TO STA. 48+40.000

STA. 43+30.730 TO STA. 43+23.130
STA. 37+46.980 TO STA. 37+35.580
STA. 33+65.000 TO STA. 33+59.600
STA. 30+29.440 TO STA. 30+18.420
STA. 22+84.000 TO STA. 22+71.300
STA. 21+15.700 TO STA. 21+03.000
STA. 17+90.000 TO STA. 17+80.900
STA. 16+52.700 TO STA. 16+40.000
STA. 15+70.000 TO STA. 15+57.300
STA. 12+80.000 TO STA. 12+67.938

1.75 UTILITY MARKERS (Bid Item 0101).

1.75.1 Measurement

Measurement of utility markers will be the number of utility markers acceptably installed.

1.75.2 Payment.

Payment for Utility Markers will be made at the applicable contract price, which payment shall constitute full compensation for fabricating and installing the utility marker on the east side of utility being marked, complete, including utility marker consisting of schedule 80 PVC extending 0.610 meter above finished grade filled with grout/concrete and set in concrete filled five gallon bucket, with utility (i.e. electric, telephone, gas, water, sewer, etc.) being stenciled on schedule 80 PVC above finished grade, grout/concrete, paint, earthwork, protection of utility marker while in place, and all incidentals, complete.

1.76 ADJUST SEWER MANHOLE FRAMES AND COVERS (Bid Item 0103)

Measurement and payment shall be made according to the contract unit price for each manhole acceptably adjusted to finished grade elevation. Existing covers, including frames, grates, or lids shall be adjusted to the required elevation by removing such existing covers and adjusting the top of the existing structures by removing or adding concrete, riser, cone, grade rings, or by using cast iron adaptor rings, as the case may be, reinstalling the fixtures by supporting them on a satisfactory collar of Class A concrete constructed as to hold them firmly in place.

1.77 RCB CHANNEL LOUGHTON POWERS (Bid Item 0104).

Payment for RCB Channel Loughton Powers will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Loughton Powers RCB Structure from Sta. 20+78.580 to Sta. 18+73.180, except earthwork and except manholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, complete as shown on the drawings.

1.78 RCB CHANNEL BADURA (Bid Item 0105).

Payment for RCB Channel Badura will be made at the applicable contract

price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Badura RCB Structure from Sta. 21+03.000 to Sta. 20+78.580, except earthwork and except manholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, including headwall, complete as shown on the drawings except for chain link fencing.

1.79 OVERBURDEN RHODES RANCH ENTRYWAY (Bid Item 0106).

1.79.1 Measurement

Measurement for overburden Rhodes Ranch Entryway will be made on the basis of the actual volume, in cubic meters, as follows, between Station 33+65.000 through Station 37+21.439.

The overburden Rhodes Ranch Entryway quantity shall be surveyed and computed based on the following. The survey shall capture the elevations of a plane 0.610 meters above the top of the reinforced concrete box structure along the overburden area as shown on drawing sheet C22, Channel Typical Section, "Sta. 33+65.000 to Sta. 37+21.439". This 0.610 elevation plane above the reinforced concrete box shall be extended level (same elevation) to the west edge of the TCE limits to create a bottom for the overburden template. This template shall include a 1:1 slope up to daylight at and within the west TCE limit. This bottom of overburden shall then be compared with the actual existing finish grade elevations for the same area to create a volume of overburden. Survey data and calculations shall be submitted to the Contracting Officer prior to removing any overburden.

1.79.2 Payment

Payment for Overburden Rhodes Ranch Entryway will be made at the applicable contract price per cubic meter and includes handling of overburden material at identified Rhodes Ranch overburden site which includes overburden material on flood easement on West side of Durango Drive between station 33+65.000 through station 37+21.439 indicated herein; and shall be considered full payment for all work including surveying for quantity verification, stockpiling and grading to final grade lines to match existing topography per survey data, complete.

1.80 PROTECT IN-PLACE ARLINGTON RANCH SEWER LINE (Bid Item 0108)

Payment for providing protect in-place Arlington Ranch Sewer Line within excavation limits of channel from Sta. 43+30.000 through Sta. 48+00.000 to protect PVC sewer line for Arlington Ranch improvements will be made at the applicable contract price, which payment shall constitute full compensation for furnishing shoring as necessary, labor and necessary equipment, for duration of related construction work in area, to protect and support in-place Arlington Ranch sewer line improvements as specified, and removal of said shoring if utilized when related work is completed.

1.81 ADJUST ARLINGTON RANCH SEWER MANHOLES (Bid Item 0109)

Payment for providing adjust Arlington Ranch Sewer manholes within

excavation limits of channel from Sta. 43+30.000 through Sta. 48+00.000 to adjust the height of 4 manholes for Arlington Ranch improvements will be made at the applicable contract price, which payment shall constitute full compensation for furnishing shoring as necessary, labor and necessary equipment, for duration of related construction work in area, to adjust the height of Arlington Ranch sewer manholes improvements as specified, and removal of said shoring if utilized when related work is completed.

1.82 CHAIN LINK FENCE, 1.219 M HIGH (Bid Item 0110).

1.82.1 Measurement.

Measurement of chain link fence, 1.219 M HIGH will be by the linear meters of chain link fencing constructed as shown on the drawings.

1.82.2 Payment.

Payment for Chain Link Fence, 1.219 M HIGH 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, anchor bolt assemblies, base plate assemblies, grout and/or drypack, grounding, and all incidentals, complete as shown on the drawings.

1.83 RCB CHANNEL TIBERTI SOUTH (Bid Item 0112).

Payment for RCB Channel Tiberti South will be made at the applicable contract price, which payment shall constitute full compensation for the Upper Blue Diamond Diversion Channel Tiberti South RCB Structure from Sta. 25+19.089 to Sta. 22+84.000, except earthwork and except manholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, including headwall, complete as shown on the drawings except for chain link fencing.

1.84 SINGLE SWING GATES, 1.000 X 1.219 (Bid Item 0113).

1.84.1 Measurement

Measurement of single swing gates, 1.000 x 1.219 will be the number of single swing gates, 1.000 x 1.219 acceptably installed.

1.84.2 Payment.

Payment for Single Swing Gates, 1.000 x 1.219 will be made at the applicable contract price, which payment shall constitute full compensation for fabricating and installing the single swing gates, 1.000 wide x 1.219 high, complete, including posts with caps, chain link fabric, frame members, tension bands, truss rods, stretcher bars, wire ties, truss wire, anchor bolt assemblies, base plate assemblies, hinges, grout and/or drypack, stops and padlocks, and all incidentals, complete, as shown on the drawings.

1.85 BELTWAY LATERAL TRANSITIONAL RCB STRUCTURE AT DURANGO DRIVE (Bid Item 0114).

Payment for Beltway Lateral Transitional RCB Structure at Durango Drive will be made at the applicable contract price, which payment shall constitute full compensation for the Beltway Transitional RCB Structure at Durango Drive from Sta. 12+33.130 to Sta. 12+26.53, except earthwork and except manholes, complete, including furnishing and placing reinforcing steel; furnishing, placing, finishing and curing concrete, and all incidentals, including headwall and dowels, complete as shown on the drawings except for chain link fencing.

1.86 ORNAMENTAL METAL FENCE GATES, SINGLE SWING, 1.000 X 1.800 (Bid Item 0115).

1.86.1 Measurement

Measurement of ornamental metal fence gates, single swing, 1.000 x 1.800 will be the number of ornamental metal fence gates, single swing, 1.000 wide x 1.800 high acceptably installed.

1.86.2 Payment.

Payment for ornamental metal fence gates, single swing, 1.000 x 1.800 will be made at the applicable contract price, which payment shall constitute full compensation for fabricating and installing the matching ornamental metal fence gates, single swing, 1.000 wide x 1.800 high, complete, including posts with caps, rails, pickets, frame members, all associated fabrication, connections including bolting and/or welding, anchor bolt assemblies, base plate assemblies, concrete and/or grout and/or drypack, hinges, surface preparation and painting, grounding, and all incidentals, including stops and padlocks, complete.

1.87 CHAIN LINK FENCE, 1.829 M HIGH, 11 GAGE (Bid Item 0116).

1.87.1 Measurement.

Measurement of chain link fence, 1.829 M High, 11 Gage will be by the linear meters of chain link fence, 1.829 M high, 11 Gage, constructed as shown on the drawings. The chain link fence, 1.829 M high, 11 gage shall be installed along the Temporary Construction Easement (TCE) of the Rhodes Ranch Property Between Station 43+30.730 through Station 30+18.420

1.87.2 Payment.

Payment for Chain Link Fence, 1.829 M High, 11 Gage, 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, concrete, grounding, and all incidentals, complete as shown on the drawings, including coordination of chain link, 1.829 M, 11 gage installation on Rhodes Ranch Property with Rhodes Ranch.

1.88 PLANT NURSERY AREA, TEMPORARY (Bid Item 0012).

Payment for Plant Nursery Area, Temporary will be made at the applicable

contract price, which payment shall constitute full compensation for the provision of a 15 meter x 10 meter chain link 9 gage 1.829 m high fenced off area with barbed wire and access gate that will safely store the salvaged desert plants, including site preparation, installation of temporary fence, fence posts, excavation for fence posts, concrete for fence posts, fabric, gate and barbed wire, and removal of temporary plant nursery area including all fence, posts, concrete, gates, barbed wire and debris, prior to conclusion of construction but after replanting of salvaged desert plants.

1.89 REMOVE, SALVAGE AND REPLACE FENCE (Bid Item 0123).

1.89.1 Measurement.

Measurement of remove, salvage and replace fence will be by the linear meters of fence removed, salvaged and replaced in locations shown on the drawings. The replacement fence, whether salvaged or new, shall be of the same dimensions and fabric of the existing fence that is removed and installed in the locations shown on the drawings. The replacement posts, whether salvaged or new, shall be of same dimension and with same concrete embedment depth as those of the removed existing fence.

1.89.2 Payment.

Payment for remove, salvage and replace fence will be made at the applicable contract price, which payment shall constitute full compensation for: removing existing fence (including posts and foundations for posts), except for chain link fence on south side of channel from Sta. 14+40.000 to Sta. 10+00.000 which shall not be removed during entire project unless directed to do so by the Contracting Officer; salvaging and replacement with fence of similar dimensions and fabric to that of existing fence, including posts with caps, rail, stretcher bars, fence fabric, tension bands, wire ties, truss wire, concrete, grounding, and all incidentals, complete as shown on the drawings C13, C14, and C15, including coordination of removal and replacement of fence with all agencies including but not limited to Nevada Dept. of Transportation, Clark County Dept. of Public Works, Clark County Regional Transportation Commission; not including work on chain link fence shown in drawing sheets D7, D8 and D12, which are covered under another bid item.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02300

EARTHWORK

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 DEGREE OF COMPACTION
- 1.4 DEFINITION OF SATISFACTORY MATERIALS
- 1.5 DEFINITION OF UNSATISFACTORY MATERIALS
- 1.6 MISCELLANEOUS FILL

PART 2 PRODUCTS

- 2.1 SOIL STABILIZER PRODUCT
- 2.2 BLM IMPORT MATERIAL REQUIREMENTS

PART 3 EXECUTION

- 3.1 EXCAVATION, GENERAL
 - 3.1.1 Excavation Plan
 - 3.1.2 STRIPPING, BLM LAND ONLY
 - 3.1.3 BLM LANDS MATERIAL AND ALL OTHER LANDS MATERIAL
 - 3.1.4 BLM IMPORT MATERIAL REQUIREMENTS
 - 3.1.5 Excess Excavated Material on All Other Property
 - 3.1.5.1 Satisfactory Materials
 - 3.1.5.2 Unsatisfactory Materials
 - 3.1.6 Haul Routes
- 3.2 EXCAVATION, BLASTING
 - 3.2.1 General Requirements
 - 3.2.2 Blasting
 - 3.2.2.1 Blasting Nearby Structures and Utility Lines
 - 3.2.3 Overshooting
 - 3.2.4 Pre-excavation Survey
 - 3.2.4.1 Vibration Monitoring
 - 3.2.5 Notifications
 - 3.2.6 Qualifications
 - 3.2.7 Post-Blast Data Reports
 - 3.2.8 Explosives
 - 3.2.8.1 Safety
 - 3.2.8.2 Storage
- 3.3 PRESERVATION OF PROPERTY
- 3.4 EXCAVATION FOR STRUCTURES
- 3.5 EXCAVATION CHANNEL
- 3.6 EXCAVATION OF INLET STRUCTURE BASIN
- 3.7 EXCAVATION FOUNDATIONS

- 3.7.1 Excavation of Inspection Trench
- 3.7.2 Excavation of Inlet Structure Embankment
- 3.8 EXCAVATION OF OUTLET CONDUIT
- 3.9 REMOVAL OF UNSATISFACTORY MATERIALS
- 3.10 DISPOSITION AND DISPOSAL OF EXCAVATED MATERIALS
 - 3.10.1 Hauled Excavated Material
- 3.11 OVERCUT
- 3.12 COMPACTION EQUIPMENT
- 3.13 GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS
 - 3.13.1 Control
 - 3.13.1.1 Laboratory Control
 - 3.13.1.2 Field Control
 - 3.13.2 Settling of Fills or Backfills with Water
 - 3.13.3 FILL MATERIAL
 - 3.13.3.1 Fill Material for Reconstruction of Frontage Road
 - 3.13.3.2 Fill Material for Frontage Road Detour
 - 3.13.4 Placement
 - 3.13.4.1 Ground Vibration
 - 3.13.5 Moisture Content
 - 3.13.6 Compaction
- 3.14 COMPACTED FILL, CHANNEL
 - 3.14.1 Invert
 - 3.14.1.1 Preparation for Placing
 - 3.14.1.2 Compaction
 - 3.14.2 Behind Channel Walls
 - 3.14.2.1 Limitations on Equipment
 - 3.14.2.2 Construction Balance
 - 3.14.2.3 Compaction
 - 3.14.2.4 Trimming
 - 3.14.2.5 Backfill Against Plywood at Ends of Pipe and Sewer Stubs
 - 3.14.3 Compacted Fill Over Covered Channel
 - 3.14.3.1 General
 - 3.14.3.2 Material
 - 3.14.3.3 Placement
 - 3.14.3.4 Contractors Option
 - 3.14.3.5 Compaction
 - 3.14.4 Compacted Fill, Roadway
 - 3.14.4.1 Compaction
 - 3.14.4.2 Trimming
- 3.15 COMPACTED FILL, INLET STRUCTURE EMBANKMENT
 - 3.15.1 Foundation Preparation
 - 3.15.1.1 Foundation Preparation, Rock Abutments
 - 3.15.2 PLACEMENT AND COMPACTION, INLET STRUCTURE EMBANKMENT
 - 3.15.3 Compacted Fill For RCB Outlet Conduit
 - 3.15.3.1 Compaction
 - 3.15.3.2 SUBGRADE FOR RCB OUTLET CONDUIT
 - 3.15.3.3 LIMITATIONS ON EQUIPMENT, RCB OUTLET CONDUIT
 - 3.15.4 Settlement
 - 3.15.5 Settlement Monitoring
 - 3.15.6 Settlement Monument Protection Plan
 - 3.15.7 Regrading of Embankment Crest
 - 3.15.8 Basin
 - 3.15.8.1 Location
 - 3.15.8.2 Preparation for Placing

- 3.15.8.3 Compaction
- 3.16 BACKFILL
 - 3.16.1 Structural Backfill
 - 3.16.1.1 Location
 - 3.16.1.2 Material
 - 3.16.1.3 Placing
 - 3.16.1.4 Compaction
- 3.17 SUBGRADE PREPARATION
 - 3.17.1 Subgrade for Channel
- 3.18 SOIL STABILIZER

-- End of Section Table of Contents --

SECTION 02300

EARTHWORK

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.

U.S. ARMY CORPS OF ENGINEERS (USACE)

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

ASTM INTERNATIONAL (ASTM)

ASTM D 422 (1963; R 1998) Particle-Size Analysis of Soils

ASTM D 1556 (2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D 1557 (2000) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))

ASTM D 2216 (1998) Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 2487 (2000) Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 2922 (2001) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D 4914 (1994) Density of Soil and Rock in Place by the Sand Replacement Method in a Test Pit

ASTM D 5030 (1994) Density of Soil and Rock in Place by the Water Replacement Method in a Test Pit.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When

used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The "RE" designates that the Resident Office will review the submittal for the Government. Submit the following in accordance with Section 01330, SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Excavation Plan; G, RE.

The Contractor shall submit his excavation plan to the Contracting Officer in conformance with paragraph EXCAVATION PLAN

Haul Route Plan; G, RE.

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

BLM Import Material Certification Form; G, RE.

The Contractor shall submit the completed material certification form to the Contracting Officer for approval 2 (two) working days prior to importation of material meeting BLM Import material requirements.

SD-02 Shop Drawings

Shop Drawings.

The contractor shall submit shop drawings showing the proposed method of bracing which he intends to use to protect existing property.

Explosive Storage Location.

The contractor shall submit to the Contracting Officer drawings showing the location, access to and type of construction of the proposed storage magazine for explosives, and cap house.

Pre-construction topographic survey of the entire project site.

The contractor shall submit to the Contracting Officer pre-construction surveys of the entire project site shown on the drawings.

Post-construction topographic survey of the entire project site.

The contractor shall submit to the Contracting Officer post-construction surveys of the entire project site for each of the compacted fill work and the stockpiled filled work shown on the drawings.

SD-05 Design Data

Pre-Blast Data Report.

Post-Blast Data Report.

The Contractor shall submit Pre- and Post-Blast Reports which shall contain

all of the pertinent data on the location by station, ground surface elevation in the area of the blast; diameter, spacing, depth, over-depth, pattern and inclination of blast holes; the type, strength, amount, distribution and powder factor for the explosives to be used and actually used per hole and per blast; the sequence and pattern of delays, and description and purpose of special methods.

SD-06 Test Reports

Field Density Tests.

Treating of Compacted Fill Materials.

Copies of all laboratory and field test reports shall be submitted to the Contracting Officer on approved forms within 24 hours of the completion of the tests.

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 DEFINITION OF SATISFACTORY MATERIALS

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

1.5 DEFINITION OF UNSATISFACTORY MATERIALS

Unsatisfactory materials include but are not limited to those materials containing roots and other organic matter, trash, debris and materials classified in ASTM D 2487, as Pt, OH, OL, CH, MH, and materials too wet (unstable) to support construction equipment. Unsatisfactory materials also include man-made fills, refuse, or backfills from previous construction, **except for identified overburden on Rhodes Ranch Properties.**

1.6 MISCELLANEOUS FILL

Miscellaneous fill shall consist of material from the required excavation, including surface soil from stripping that is in excess of topsoil material needed for areas of revegetation treatments. Miscellaneous fill shall be placed in the lines and grades indicated on the drawings and shall be placed with suitable equipment in successive horizontal layers over the entire plane of the work surface and which shall not exceed 600 millimeters in depth before consolidation. Material, including rock, cemented alluvium, BLM topsoil not being reused, from the excavations of this project that would normally be disposed of by the Contractor, may be utilized and buried as miscellaneous fill provided such material does not exceed 600 millimeters in its greatest dimension, is placed in a manner that will prevent the formation of voids, and is placed not less than 600 millimeters below finished grade (including finished grade of side slopes) and importantly, is certified clean for BLM Land import by the Contractor. No depressions in which water might pond shall be left in miscellaneous fill area. The finished areas shall be sloped to drain. Compaction other

than that obtained by the controlled movement of the construction equipment will not be required.

PART 2 PRODUCTS

2.1 SOIL STABILIZER PRODUCT

The dust palliative/soil stabilizer shall be a mixture of plaster and natural fiber mulch. The cellulose fiber mulch shall be produced from grinding clean whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7 percent. The plaster shall consist of naturally occurring high purity processed gypsum and additives. The gypsum shall be produced from a mined or quarried source. The gypsum shall be processed to be composed of crushed dry calcium sulfate hemihydrate having a purity of not less than 88 percent. The shipping invoices for the gypsum shall state the gypsum's purity content, dry weight, and source of manufacture. Processed gypsum that has become partially air set, lumpy, or caked shall not be used. The Contractor shall add a color pigment to the dust palliative/soil stabilizer slurry at the time of application. Apply color pigment to match existing soil color at the site, at the application rate recommended by the manufacturer. Color can be matched using the "Davis Colors" chart by Soil-Tech, Las, Vegas, Nevada, or equal. The gypsum and additives shall be furnished either in bags or bulk and be accompanied by bills of lading and shipping invoices. The plaster/cellulose fiber mulch shall be applied at a rate of 6.75 tonnes of plaster mixed with 2.242 tonnes of fiber per hectare.

2.2 BLM IMPORT MATERIAL REQUIREMENTS

BLM IMPORT MATERIAL REQUIREMENTS - Material shall not exceed 600 millimeters in its greatest dimension, shall originate at least 0.5 meters below existing ground level, shall not be from existing fill, backfill, compacted fill, embankment, road embankment, identified overburden, or from a non project stockpile or non project excavation source, but shall be considered newly excavated material, shall be free of any natural or manmade trash, debris, roots, construction materials, automobile or construction fluids.

PART 3 EXECUTION

Prior to the start of construction work (including clear site and remove obstructions, the Contractor shall conduct a pre-construction topographic survey of the entire project site in accordance with Section 01200 GENERAL REQUIREMENTS paragraph CONTRACTOR'S SURVEYS.

At the end of all work associated with this section, the Contractor shall conduct a post-construction topographic survey of the entire project site in accordance with Section 01200 GENERAL REQUIREMENTS paragraph CONTRACTOR'S SURVEYS.

3.1 EXCAVATION, GENERAL

Excavation shall consist of the removal of every type of material encountered in the designated areas or from areas directed. The material

to be removed may include but is not limited to hardpan, silt, sand, gravel, cobbles and boulders, cemented silt/sand/gravel/cobbles/boulders with various degrees of cementation, caliche, asphalt, vegetation, trash, and other debris. Slope lines indicated on the drawings for temporary cuts do not necessarily represent the actual slopes to which the excavation must be made to safely perform the work. Unforeseen conditions may dictate that the temporary cut slope shall be made to the actual slope to which the work can be safely performed. Measurement and payment for excavation will be made in accordance with Section 01270. Excavation for permanent cuts shall be made to the slope lines indicated. Excavation will likely require ripping or other rock-excavation techniques, which may include blasting, and shall be performed in a manner which will not impair the subgrade. Use of 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. Except as otherwise specified, the finish surface of subgrades shall be smooth and shall not vary more than 25 mm from indicated grade, except at areas to receive concrete where finished surfaces of subgrade shall not vary more than 12.5 mm from indicated grade. Prior to commencing excavation, the Contractor shall submit his Excavation Plan to the Contracting Officer. All subgrade excavations will be inspected by the Contracting Officer prior to placement of any fill materials.

- A. No subsurface investigation has been conducted by the Corps of Engineers from Sta 10+00 to Sta 16+00 (approx) of the the Upper Blue Diamond Diversion Channel, Sta 10+00 to Sta 12+33 of the Beltway Lateral and the Beltway Borrow Pit Area, due to previous accessibility constraints. These areas are considered to be comprised of highly cemented materials and the Contractor shall be required to utilize blasting or other rock excavation techniques throughout. Oversized rock or cemented materials from the excavation shall be crushed or otherwisely processed to meet compacted fill gradation requirements for new channel backfill, detour and frontage road embankments and grading, and the restoration of the borrow site area.

3.1.1.1 Excavation Plan

Prior to commencing excavation, the Contractor shall submit his plan for excavation to the Contracting Officer for acceptance. The plan must show all proposed locations of excavation operations utilizing methods involving blasting, headache balling, hoe ramming, or other techniques as may be applicable. In addition, the plan must include the results of a pre-excavation survey, a detailed blasting plan (if applicable) performed by a certified blasting consultant, and a seismic monitoring plan. The excavation plan shall be updated and resubmitted to the Contracting Officer any time the Contractor proposes altering his methods. The Contractor's methods for excavation are solely his responsibility. Approval of the excavation plan by the Contracting Officer will in no way limit the Contractor's liability regarding property damaged by this operations, nor will it alter the Contractor's sole responsibility for the safety of his operations. The Contractor shall be responsible for all damage caused by his excavation operations and be responsible for answering all complaints.

The Contractor shall provide the Contracting Officer with 30 days advance warning of the use of excavation techniques which may lead to property damage to allow for review of the proposed techniques, to confirm general compliance with these specifications, and to allow monitoring of the excavations methods.

3.1.2 STRIPPING, BLM LAND ONLY

Stripping consists of removing loose (not requiring blasting or ripping) surface soils approximately 200 millimeters deep from the areas of intended channel excavation, basin excavation and embankment footprint, after plant salvage operations in accordance with Section 02910 NATIVE PLANT EXTRACTION, SALVAGE AND STORAGE, on BLM land only. Stripping operations shall include clearing of remaining grasses, weeds, and non-salvaged shrubs. Surface soils so stripped shall be stockpiled, within BLM land ROW and TCE limits, for use as topsoil in areas of revegetation treatment or as miscellaneous fill on the downstream side of the transition inlet structure embankment, on BLM land only. The BLM lands are south of Sta. 47+38.620.

3.1.3 BLM LANDS MATERIAL AND ALL OTHER LANDS MATERIAL

All excavated materials from BLM Lands will remain on BLM Lands and used on BLM lands as compacted fill or miscellaneous fill. Trash and debris shall be handled in accordance with Section 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS.

Excavated materials from All Other Lands or from other sites will not be transported, temporarily or permanently, onto BLM Lands, nor utilized as compacted fill or miscellaneous fill for any portion of the project that is on BLM lands, unless excavated materials from this project are certified by the Contractor to meet BLM requirements as per paragraph BLM IMPORT MATERIAL REQUIREMENTS of this section. The BLM lands are south of Sta. 47+38.620.

3.1.4 BLM IMPORT MATERIAL REQUIREMENTS

An estimated amount of excavated material originating on non-BLM Lands from this project is required to be imported onto BLM Land for this project, and this material to be imported onto BLM Land is not considered as excess excavated material.

The Contractor shall submit the completed BLM Import Material Certification Form to the Contracting Officer for approval 2 (two) working days prior to importation of material meeting BLM Import material requirements. The form shall be generated by the Contractor and shall be considered complete with the following information:

- A. **Typed or written name of individual.**
- B. **Typed or written name of Company.**
- C. **Quantity of material to be imported.**
- D. **Location where material originated from, including Northing, Easting,**

and approximate origination depth, including map of origination attached.

E. Location where material will be utilized on BLM Lands, including Northing, Easting, and at approximate station of channel or embankment, including map of destination attached.

F. Paragraph on this form with the following "I certify that this imported material does not exceed 600 millimeters in its greatest dimension; originated at least 0.5 meters below existing ground level from this project; is not from existing fill, backfill, compacted fill, embankment, road embankment, identified overburden, or from a non project stockpile or non project excavation source, but shall be considered newly excavated material from this project; is free of any natural or manmade trash, debris, weeds, seeds, roots, construction materials, automobile and/or construction fluids."

G. Signature and date of individual.

3.1.5 Excess Excavated Material on All Other Property

3.1.5.1 Satisfactory Materials

Satisfactory excavated material originating from the construction of the Upper Blue Diamond Diversion Channel from Station 10+00.000 through Station 47+38.620, except as noted in Section 01200 paragraph DISPOSAL OF EXCESS EXCAVATED MATERIAL, and not utilized in this project as fill material (fills, backfills, compacted fills) for channels, embankments, and roadways (such as Durango Drive), shall be classified as satisfactory excess excavated materials and shall become the property of the Contractor. The Contractor is allowed to dispose of the satisfactory excess excavated material from between Sta. 10+00.000 through Sta. 47+38.620 as follows: off site at no additional cost to the Government.

3.1.5.2 Unsatisfactory Materials

See paragraph DEFINITION OF UNSATISFACTORY MATERIALS for definition of unsatisfactory material. Unsatisfactory materials shall become the property of the Contractor and shall be removed from the project site.

3.1.6 Haul Routes

The Contractor is advised that the roads, streets and highways intersecting through and adjacent to the project site are all currently active and open streets to the Public. Haul routes shall be coordinated through the development of traffic control plans submitted to and approved by Clark County Department of Public Works with copies available to other agencies, developers, contractors and organizations on an as needed basis.

3.2 EXCAVATION, BLASTING

Any method used to excavate the structure or channel using explosives shall be subject to the approval by the Contracting Officer.

3.2.1 General Requirements

The drilling and blasting program and methods shall be the minimum necessary to break up the rock and/or caliche/cemented alluvium into bulldozer-manageable sized pieces for removal. Only the minimum strength explosive that will accomplish the fracturing will be allowed. If multiple charges are deemed necessary, they will be sequenced to produce good breakage of the rock or caliche/cemented alluvium and reduce airblast (sonic impacts) and ground vibrations to minimal levels. In the design of the blasting pattern, no blastholes will be permitted within 60 meters of an active tortoise or Gila Monster burrow. A qualified desert tortoise ecologist is required to be present during all blasting operations to ensure that there are no occupied burrows and/or to remove tortoises or Gila Monsters from the surface or burrows within the 60 meter limit. The desert tortoise ecologist will provide a short report with field notes to the Contracting Officer. The desert tortoise ecologist will be provided by the Contractor as his own expense. Additional restrictions may be imposed during the hibernation period (15 November through 15 March) to protect hibernating tortoises, if necessary and directed by the Contracting Officer. The Contractor shall strictly comply with all State and local regulations regarding construction blasting (e.g., Uniform Standard Specifications for Public Works Construction Off-Site Improvements, Clark County Area, Nevada, Third Edition, subsections 107.10, 203.03.03, and 208.03.01, and Engineer Manual (EM) 1110-2-3800, including all notice and reporting requirements). Under no circumstances shall blasting be performed within 30 meters of concrete that has been placed less than seven days. Blasting within 30 meters of concrete older than seven days will be permitted only if approved by the Contracting Officer.

3.2.2 Blasting

Prior to drilling for each blast, the Contractor shall submit a Pre-Blast data report plan on an approved form, which includes the pertinent data on the location by station, ground surface elevation in the area of the blast; diameter, spacing, depth, overdepth, pattern and inclination of blast holes; the type, strength, amount, distribution and powder factor for the explosives used per hole and per blast; the sequence and pattern of delays, and description and purpose of special methods. The loading of holes shall be done in the presence of a Government inspector. Acceptance by the Contracting Officer of the Pre-Blast data report plan will not relieve the Contractor of his sole responsibility to produce satisfactory results as set forth in these specifications. Drilling and blasting shall be done only to the depth, amount, and at such locations, with explosives of such quantity, distribution and density that will not produce unsafe or damaged rock and/or caliche/cemented alluvium surfaces or damage beyond the prescribed excavation limits. When a drilling and blasting program results in damage to the excavation, or to natural or man-made features, or is injurious to wildlife and habitat, the Contractor will be required to devise and employ methods which will prevent such damage. The revision may include special methods such as presplit and zone blasting, shallow lifts, reduction in size of individual blasts, small diameter blast holes, closely spaced blast holes, reduction of explosives, greater distribution of explosives by use of decking and primacord or variation in density of explosives.

3.2.2.1 Blasting Nearby Structures and Utility Lines

Blasting will not be permitted within 50 meters of existing structures and utility lines. Contractor shall use other rock excavation techniques, and deploy all means necessary to break-out and remove layers of highly cemented soils nearby the structures and utility lines. Contractor shall coordinate with utility owners prior to excavation and blasting in the vicinity of utility lines.

3.2.3 Overshooting

The Contractor shall use controlled blasting techniques so as not to overshoot. All possible care shall be exercised in drilling and blasting operations to prevent formation of discontinuities and to minimize over-break and blast damage of adjacent unexcavated ground and structures. Any material outside the authorized limits which may be shattered or loosened because of blasting shall be removed and/or re-compacted by the Contractor at his expense. Shattered or loosened material below the bottom limits of the required excavation shall be uniformly distributed and compacted or otherwise disposed of in a manner satisfactory to the Contracting Officer. The Contractor shall discontinue any method of blasting which leads to overshooting or is dangerous to the public, destructive of natural or man-made features, or is injurious to wildlife and habitat.

3.2.4 Pre-excavation Survey

The Contractor shall perform a pre-excavation survey which shall include as a minimum; detailed examination of adjacent structures, including video taping and installation of crack monitoring tape along existing structural cracks. Also included shall be a seismic survey performed by a certified seismic survey firm to determine limiting charge weights, distances to structures, etc. for all areas where blasting is proposed and limiting ball weights, height of drop, etc., for all areas where headache balls and/or hoe ram techniques are proposed.

3.2.4.1 Vibration Monitoring

During construction, the Contractor shall hire a certified seismic survey firm to perform a seismic monitoring program to determine the effects of any blasting, headache ball or hoe ram use, or any other specialized excavation technique. Particle velocities measured at an existing structure or 300 meters from the blasting, whichever is closest, shall not exceed statutory limits or 12.5 millimeters per second (whether the result of blasting or other excavation technique). In addition to these requirements, the Contractor shall provide suitable vibration monitoring equipment to measure and record ground motions at the 60 meter distance.

3.2.5 Notifications

The Contractor shall notify each property owner and public utility company having structures or facilities in proximity to the site of the work of his intention to use explosives. Such notice shall be given sufficiently in

advance to enable the companies to take such steps as they may deem necessary to protect their property from injury. Any blasting adjacent to or crossing existing utilities shall be fully coordinated with the owner of the effected utility to include hole spacing, loading and vibration.

3.2.6 Qualifications

During blasting operations, the Contractor shall have on site, and in immediate charge of the blasting, a licensed blaster acceptable to the Contracting Officer who has had no less than 3 years of experience in controlled blasting and rock excavation operations. Powder handlers shall have had no less than one year continuous experience in preparation and loading of powder charges.

3.2.7 Post-Blast Data Reports

In addition to the reporting requirements required above, a separate Post-Blast Data Report of each blast shall be prepared and furnished to the Contracting Officer on an approved form. The report shall indicate the location of the blast by specific stationing, ground surface elevation, depth of round, pounds of explosives used by type and grade, total number of loaded holes, total pounds per delay, quantity and kind of explosive in each hole, maximum measured blast vibration, and all other blast information directed by the Contracting Officer. Original or legible copies of the report shall be provided to the Contracting Officer within 24 hours of the blast event.

3.2.8 Explosives

3.2.8.1 Safety

The contractor shall fully comply with Section 29, Blasting, EM 385-1-1 and any Local or State Laws and Regulations applicable to the proposed Blasting Plan.

3.2.8.2 Storage

The Contractor shall submit to the Contracting Officer, for approval, drawings showing the explosive storage location, access to and type of construction of the proposed storage magazine for explosives, and cap house. The explosives storage magazine and other facilities may be located on project lands if a satisfactory location can be found and is approved by the Contracting Officer. The Contractor shall maintain the explosive storage area at his own expense. The explosives storage magazine shall be securely locked when not in use.

3.3 PRESERVATION OF PROPERTY

All excavation operations shall be conducted in such a manner that concrete structures, embankments, utilities, or other facilities and improvements which are to remain in place permanently will not be subjected to settlement or horizontal movement. The Contractor shall furnish and install sheet piling, cribbing, bulkheads, shores, or whatever means may be necessary to adequately support material carrying such improvements or to

support the improvements themselves and shall maintain such means in position until they are no longer needed. Temporary sheet piling, cribbing, bulkheads, shores or other protective means shall remain the property of the Contractor and when no longer needed shall be removed from the site. The Contractor shall submit for approval shop drawings showing proposed method of bracing which he intends to use. All shoring and bracing shall be designed so that it is effective to the bottom of the excavation, and shall be based upon calculation of pressures exerted by (and the condition and nature of) the materials to be retained, including surcharge imparted to the side of the trench by equipment and stored materials. Removal of shoring shall be performed in such manner as not to disturb or damage the finished concrete or other facility.

3.4 EXCAVATION FOR STRUCTURES

Excavation within the vicinity of existing structures, utilities, roads, and drainage pipes to remain in place shall be performed in a manner to prevent damage to the structure. Earth banks and facilities to remain in place shall be supported as necessary during excavation. Potential for damage resulting from severe vibration may limit the Contractor's operations or choice of equipment. In general, unless otherwise shown or specified, the actual side slopes shall be in accordance with EM 385-1-1.

3.5 EXCAVATION CHANNEL

Channel excavation consists of the removal of all materials within the lines and grades indicated.

3.6 EXCAVATION OF INLET STRUCTURE BASIN

Inlet Structure Basin excavation consists of the removal of all materials to the lines and grades indicated. The finished surface shall be reasonably smooth, free from irregular surface changes, and shall not vary more than 100 millimeters above or below the indicated grade, except that either extreme of such tolerance shall not be continuous over an area greater than 50 square meters. No part of the Inlet Structure Basin area shall be excavated below the finished contours shown on the drawings. If the actual quantities deviate from the estimated quantities, inlet structure Basin area will be expanded, and Contracting Officer will direct additional basin excavation based on the required quantities and final grading plan. The Inlet Structure Basin excavation area shall be regular in shape, graded smoothly and graded to drain. Side slopes shall not be steeper than one vertical to three horizontal and shall be uniform for the entire length of any one side, unless otherwise directed.

3.7 EXCAVATION FOUNDATIONS

3.7.1 Excavation of Inspection Trench

Inspection trench excavation consists of the removal of all materials to the lines and grades indicated after stripping. Additional excavation other than that shown on the project plans may be directed by the Contracting Officer.

3.7.2 Excavation of Inlet Structure Embankment

Excavation of Inlet Structure Embankment consist of removal of all materials within footprint of the dam embankment to the lines and grades shown on the drawings after stripping per paragraph STRIPPING, BLM LAND ONLY. The finished surface shall be reasonably smooth, free from irregular surface changes, and shall not vary more than 50 millimeters above or below the indicated grade, except that either extreme of such tolerance shall not be continuous over an area greater than 50 square meters.

3.8 EXCAVATION OF OUTLET CONDUIT

Excavation of outlet conduit consists of the removal of all materials to the lines and grades indicated for outlet conduit construction.

3.9 REMOVAL OF UNSATISFACTORY MATERIALS

The removal of unsatisfactory materials which are unsatisfactory for the foundation of the channel, or other structures, may be required in certain areas. For definition of unsatisfactory materials see paragraph: DEFINITION OF UNSATISFACTORY MATERIALS. Channel subgrade materials that cannot be brought to 95% compaction after scarification, shall be removed. The Contractor will be required to excavate any such areas to the depth directed and backfill the removal areas with compacted fill conforming to the requirements of Paragraph GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS.

3.10 DISPOSITION AND DISPOSAL OF EXCAVATED MATERIALS

Satisfactory excavated materials originating from the construction of the Upper Blue Diamond Diversion Channel that are suitable for required fills shall be used directly in the work, or if not immediately utilized shall be placed in temporary stockpiles within TCE limits shown on drawing sheets for further processing, hauling, handling, stockpiling and then used directly as compacted fill in portions of the work as scheduled by the Contractor. Any stockpile shall be placed in a manner to preclude ponding of water.

The Contractor shall process the stockpiled material as necessary and haul and utilize the material as compacted fill to the lines and grades in the fill areas shown on drawing sheets.

Materials and soils that the Contractor places in the temporary stockpiles shall be satisfactory excavated material and satisfactory excess excavated material originating from the construction of the Upper Blue Diamond Diversion Channel and shall be free from trash, dumped debris and demolition products, and shall consist of no materials and soils suspected of having characteristics of hazardous and/or toxic waste materials characterized as unsatisfactory soil and material including trash, dumped debris and demolition products, and shall meet the requirements of paragraph of this section. Materials and soils suspected of having characteristics of hazardous and/or toxic waste materials characterized as unsatisfactory soil including trash, dumped debris and demolition products and unstable soils shall become the property

of the Contractor and shall be removed from the project site in accordance with the requirements Section 01355 ENVIRONMENTAL PROTECTION and Section 01200 GENERAL REQUIREMENTS. No excavated material or waste of any kind shall be removed beyond the project limits under this contract without the express written authority of the Contracting Officer, or as allowed under the contract. Prior to placing satisfactory material and satisfactory excess material, the approved stockpile site(s) shall be cleared of trash and vegetation. Vegetation shall be removed by grading the existing ground surface to a depth of 150 mm. Any stockpile shall be placed in a manner to preclude ponding of water. Natural ground and surface soils and materials thus excavated and removed will then be designated as either:

- i. Materials to be salvaged, or
- ii. Scrap and unsatisfactory materials and soils and unstable materials and soils to be treated as specified above and in Section 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS.

3.10.1 Hauled Excavated Material

The Contractor shall develop a haul route plan for haul within the project limits, including removal of required excavated materials and placing fill materials and hauling of excavated material and excess excavated material, that utilizes the drawings provided. The haul route plan shall be submitted to the Contracting Officer for approval. Haul routes for transport of the excavated material and excess excavated material shown on the drawing sheets are approximate. See Section 01200 GENERAL REQUIREMENTS for additional requirements and information on excavated material haul routes. The Contractor shall be responsible for obtaining all permits and licenses necessary to haul material off-site. The Contractor will provide to the Contracting Officer three copies of the proposed street haul route plan for transport of all excavated material and excess excavated material.

3.11 OVERCUT

Except as otherwise specified or specifically ordered in writing, any overcut or excavation beyond the lines and grades indicated in the plans (or as directed) shall be backfilled with compacted fill conforming to the Paragraph GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS, or concrete conforming to the Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE. Subgrades shall be prepared in accordance with paragraph SUBGRADE PREPARATION. The Contractor shall expect to overbuild and trim back the compacted fill required to backfill overcuts made at trapezoidal channel sections. All excavating, backfilling, compacting of backfill, and concreting occasioned thereby shall be by the Contractor at no additional cost to the Government. Any overcut under existing or newly constructed channels and structures shall be backfilled with concrete.

3.12 COMPACTION EQUIPMENT

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

3.13 GENERAL REQUIREMENTS FOR COMPACTED FILLS AND COMPACTED BACKFILLS

In accordance with paragraph BLM LANDS MATERIAL AND ALL OTHER LANDS MATERIAL, material generated through earthwork activities on BLM Lands must be reused as fill, compacted and miscellaneous as indicated on the drawings, for the Inlet Structure Embankment and Channel that are on the BLM Lands.

Satisfactory excess excavated material from earthwork activities from Sta. 10+00.000 through Sta. 47+38.620 shall become the property of the Contractor and be removed from the project site at no additional cost to the Government.

3.13.1 Control

Moisture-density relations shall be established by the Contractor. The soil used for each maximum density test shall be classified in accordance with ASTM D 2487 and shall include a particle size analysis in accordance with ASTM D 422. At least one five point maximum density test shall be made for every 10 field density tests. Field density test shall be performed by the Contractor at the frequency established in paragraph Field Control, and in such locations to insure that the specified density is being obtained. Moisture-density relations and field densities shall be reported on approved forms. One copy of density data less dry weight determinations shall be provided on the day each test is taken. The completed field density tests report shall be provided with the Contractor Quality Control Report on the work day following the test. All data related to the treating of compacted fill materials shall be submitted to the Contracting Officer on approved forms within 24 hours of the completion of the tests.

3.13.1.1 Laboratory Control

Moisture-density relations shall be established by the Contractor. One moisture-density relation shall be made for each classification, blend or change in classification of soil materials encountered. Approval of moisture-density relations shall be obtained prior to the compacting of any material in the work. The moisture-density relations shall be determined in a laboratory in accordance with ASTM D 1557.

- a. The desired amount of mixing water will be added for each compaction test specimen, mixed well, and the mixture will be placed in a container with an airtight cover and allowed to cure for 24 hours. A shorter curing time may be allowed where tests show that shortening the curing time will not affect the results.

3.13.1.2 Field Control

Field in-place density shall be determined in accordance with ASTM D 1556. The field moisture content shall be determined in accordance with ASTM D 2216. Determination of in-place densities using the nuclear method ASTM D 2922 may be used to supplement the sand cone density tests ASTM D 1556. When ASTM D 2922 is used, the calibration curves shall be checked and

adjusted using only the sand cone method as described in ASTM D 1556. When material contain considerable amount of rock or coarse gravel in-place density test method ASTM D 4914 or ASTM D 5030 shall be used. At least one adjacent sand cone test shall be performed for every five nuclear density tests performed. If field density tests determined by the nuclear method vary by more than 0.1 kilonewtons per cubic meter from comparison sand-cone tests, and are consistently high or low, adjustment of the calibration curve is necessary.

a. In-Place Densities

(1) One test per 750 cubic meters, for the first 7,500 cubic meters of material and one test for each 1,500 cubic meters thereafter, or fraction thereof, shall be made of each lift of fill or backfill areas compacted by other than hand-operated machines. At least one test shall be made in each 600 mm layer of compacted fill or backfill processed as a unit and not less than one test shall be made in each area. One test per 300 cubic meters, or fraction thereof, shall be made of each lift of fill or backfill areas compacted by hand-operated machines. The contractor CQC shall maintain a log of all tests, which will, updated and submitted to the contracting officer on a weekly basis. The test log shall include: Test number (if retest shall include retest number), date, feature of work, station and offset, elevation, weight of wet soil, weight of dry soil, percent of compaction, optimum moisture content, maximum dry unit weight, soil classification, in-place density test methods either sand-cone or nuclear densimeter.

(2) One test per 400 cubic meters, or fraction thereof, shall be made of each lift of fill or backfill areas compacted by hand-operated machines. The Contractor CQC shall maintain a log of all tests which will updated and submitted to the Contracting Officer on a weekly basis. The test log shall include: Test number (if retest shall include retest number), date, feature of work, station and offset, weight of wet soil, weight of dry soil, percent of compaction, optimum moisture content, maximum dry unit weight, soil classification, in-place density test methods either sand-cone or nuclear densimeter.

3.13.2 Settling of Fills or Backfills with Water

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

3.13.3 FILL MATERIAL

Fill material shall be obtained from the required excavation. Materials considered unsatisfactory for use as compacted fill include but are not limited to those materials containing roots and other organic matter, trash, debris, chunks or clumps of cemented material. Materials classified in ASTM D 2487 as MH, CH, Pt, OH, and OL are also considered unsatisfactory for use as compacted fill. Satisfactory fill material shall contain no stone whose greatest dimension is more than 3/4 the lift thickness. The Contractor shall expect to break-down, crush or otherwise process required excavation material for use as fill material due to the cementation of in-situ soils.

Material for compacted fill behind concrete structures, channel walls, and around box culverts shall contain less than 30 percent by weight passing the .075 mm sieve and shall contain no particle larger than 76 mm.

3.13.3.1 Fill Material for Reconstruction of Frontage Road

Satisfactory materials obtained from required channel excavation and material obtained from existing Frontage road removal shall be used for reconstruction of the Frontage road. Material shall be well graded and free from organic matter, trash, debris, chunks or clumps of cemented material and shall not contain any stones larger than 75 mm.

3.13.3.2 Fill Material for Frontage Road Detour

Satisfactory material obtained from the required excavation shall be used in Frontage Road Detour. Materials considered unsatisfactory for use as compacted fill include but are not limited to those materials containing roots and other organic matter, trash, debris, chunks or clumps of cemented material. Satisfactory fill material shall contain no stone whose greatest dimension is more than 3/4 the lift thickness.

3.13.4 Placement

Fill material shall not be placed against concrete which has not been in place at least 14 days or until the concrete has attained a strength of 17.2 megapascals when tested in accordance with the Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE. Fill shall not be placed over covered channels (roof decks) until the concrete has obtained 70% of the contract required design strength. Heavy equipment shall not be operated over pipes and buried structures until at least 600 mm of fill material have been placed and compacted over them. Material from the top of the pipe or buried structure to 600 mm above pipe or buried structure shall be compacted by mechanical tampers or other equipment approved by the Contracting Officer. Compacted fill shall be placed with suitable equipment in horizontal layers which before compaction, shall not exceed 300 mm in depth for rubber-tired or vibratory rollers, 200 mm in depth for tamping rollers, 100 mm in depth when mechanical tampers are used. The Contractor may vary the layer thickness within these limits for most efficient operations. Material containing stones shall be placed in a manner to prevent the stones from striking the concrete structures and to prevent the formation of voids.

3.13.4.1 Ground Vibration

Contractor is responsible for any damages to the nearby housing and structures due to the ground vibration caused by movement of heavy conventional equipments or vibratory rollers. The contractor shall deploy all means necessary to mitigate or preclude ground vibration when compaction equipments are operating close by the residential areas.

3.13.5 Moisture Content

Material shall have a uniform moisture content while being placed and

compacted. Water shall be added at the source, if required, or by sprinkling each layer of material during placement. Uniform distribution of moisture shall be obtained by disking, harrowing, or otherwise manipulating the soil during and after time water is added. Material containing an excess of moisture shall be manipulated with suitable implements to facilitate maximum aeration and shall be permitted to dry to the proper consistency before being compacted. Fill shall have a maximum moisture content of not more than 2 percent above optimum and a minimum moisture content of not less than 2 percent below optimum.

3.13.6 Compaction

No layer of fill shall be compacted before the practicable uniform moisture content has been obtained. Scarified areas shall be compacted as specified for the fill placed thereon. Rollers will not be permitted to operate within 300 mm of channel or structure walls or over buried structures until the compacted fill over the top of the structures has reached a depth of 600 mm. Compaction equipment shall be so operated that structures are not damaged nor overstressed during compaction operations. Mechanical tampers shall be used for compaction of fill material adjacent to structures where rolling equipment is impracticable for use in compaction.

3.14 COMPACTED FILL, CHANNEL

3.14.1 Invert

3.14.1.1 Preparation for Placing

The foundation for the compacted fill to be placed shall be cleared of all existing obstructions, vegetation and debris. Any trash or debris shall be removed in accordance with Section 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS. Unsatisfactory or unstable (too wet) material and soils not meeting the requirements for fill material shall be removed where directed.

The existing surfaces for the compacted fill at the channel site shall be scarified to a depth of 150 mm and proofrolled by four passes of the compaction equipment. The subgrade for the channel shall be prepared in accordance with paragraph SUBGRADE PREPARATION.

3.14.1.2 Compaction

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

3.14.2 Behind Channel Walls

3.14.2.1 Limitations on Equipment

The gross weight of any piece of equipment, or the combined weight of any combinations of equipment coupled together, used to place, moisten and/or compact fill behind channel walls and up to 600 mm above the top of covered sections shall not exceed 16,000 kilograms, including dynamic forces produced by vibratory equipment. Equipment used to compact the fill behind the channel walls shall be of such size as to be capable of operating in the area between the cut slope and the channel wall. Compaction equipment

will not be required to operate at elevations lower than 600 mm above the top of wall footings. This equipment shall be of such size as to be capable of operating in the area between the cut slope and the channel wall at any point 600 mm above the top of the heel of wall footings.

3.14.2.2 Construction Balance

Fills behind wall on one side of the channel shall not exceed by more than 1.5 meters the height of the fill behind the opposite channel wall at any time during construction (except restricted by design).

3.14.2.3 Compaction

Each layer of fill behind channel walls, shall be compacted to not less than 90 percent of maximum density, per ASTM D 1557. The top 300 mm of the maintenance road adjacent to the channel wall shall be compacted to not less than 95 percent of maximum density per ASTM D 1557.

3.14.2.4 Trimming

The top of fill adjacent to channel walls shall be trimmed to the lines indicated on the drawings with a tolerance of plus or minus 25 mm. Any material loosened by trimming shall be recompact and the area moistened and compacted with one pass of a smooth-wheeled roller. Tolerances shall apply after rolling. Fill slopes shall be trimmed to a uniform alignment at the top of the berm and reasonably uniform slope at or outside the lines shown on the drawings.

3.14.2.5 Backfill Against Plywood at Ends of Pipe and Sewer Stubs

Plywood shall be braced or otherwise held flush against the end of the pipe during backfilling. The Contractor shall make sure the plywood is of sufficient size to adequately cover the pipe or sewer stub opening. The Contractor shall attach blocks or shims to roughly fit the inside diameter of the pipe to assure that the plywood is not displaced during backfilling.

3.14.3 Compacted Fill Over Covered Channel

3.14.3.1 General

No fill material shall be placed over the top of the covered channel until all voids at the sides of the covered channel have been filled as described below, and until all caved material has been compacted to the specified density to the top of the roof slab.

3.14.3.2 Material

Materials for filling voids shall be clean sand, free of trash, organic materials, debris, and with 100 percent passing the 4.75 mm sieve and not more than 10 percent passing the 150 mm sieve.

3.14.3.3 Placement

The first layer of fill over the concrete box section shall be 300 mm in

thickness and shall be compacted with a rubber-tired or vibratory roller having a maximum weight of 9,000 kilograms. The remainder of the fill shall be deposited in 150 mm layers and compacted with rubber-tired or vibratory rollers, or other approved equipment with a maximum weight of 9,000 kilograms until the structure has a cover of at least 600 mm. The remainder of the compacted fill shall be placed as specified in paragraph COMPACTED FILL, CHANNEL of this section.

3.14.3.4 Contractors Option

If the Contractor elects to leave the inside forms and shoring in place, permission will be granted to place fill material 48 hours after concrete has been placed.

3.14.3.5 Compaction

Each layer of fill on top of the covered channel shall be compacted to not less than 95 percent of maximum density, per ASTM D 1557. Compacted Fill under streets and maintenance roads shall be compacted per paragraph COMPACTED FILL, ROADWAY.

3.14.4 Compacted Fill, Roadway

3.14.4.1 Compaction

Fill shall be compacted to not less than 95 percent of maximum density per ASTM D 1557 for the width of all traveled ways plus 1 meter on each side thereof.

- A. Compacted Fill, Frontage Road - Fill shall be compacted to not less than 95 percent of maximum density per ASTM D 1557 for the width of traveled ways including road shoulders.
- B. Compacted Fill, Frontage Road Detour - Fill shall be compacted to not less than 90 percent of maximum density per ASTM D 1557 except top 1 meter that shall be compacted for the width of traveled ways including road shoulders.

3.14.4.2 Trimming

All street and maintenance road shoulders and side slopes shall be trimmed to the lines indicated on the drawings with a tolerance of plus or minus 25 millimeters. Any material loosened by trimming shall be recompact and the area moistened and compacted with one pass of a smooth-wheeled roller. Tolerances shall apply after rolling. Fill slopes shall be trimmed to a reasonably uniform slope at or outside the lines shown on the drawings.

3.15 COMPACTED FILL, INLET STRUCTURE EMBANKMENT

3.15.1 Foundation Preparation

Before placing material for compacted fill, the foundation surface shall be cleared of all existing obstructions, vegetation, and debris in accordance with Section 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS. Within the inlet

structure embankment footprint, excluding miscellaneous fill zone, the following shall be removed: (1) the upper 1.5 meters of foundation soil within an inspection trench, 4 meters wide, along the centerline of the embankment, (2) the upper 1.5 meters of foundation soil in designated wash areas, (3) the upper 0.610 meters of foundation soil within the footprint of the inlet structure embankment outside of the inspection trench and designated wash areas, and (4) the material shall be removed in accordance with SECTION 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS and this SECTION 02300 EARTHWORK. The inspection trench and the banks of the existing washes shall be excavated as shown on the plans and in accordance with this SECTION 02300 EARTHWORK. Depths may be reduced where hard cemented materials or bedrock is encountered subject to the approval of the Contracting Officer. Unsatisfactory materials not meeting the requirements for fill material shall be removed where directed, and if free of trash, debris, construction materials and/or contamination may be used as miscellaneous fill on BLM Lands of this project. The existing surfaces, including the excavated inspection trench and banks and the areas beneath the outlet structure and conduit within the footprint of the Inlet Structure embankment, shall be scarified to a depth of 150 millimeters and proofrolled by four passes of the compaction equipment before placing the fill. Sloped ground surfaces steeper than one vertical to four horizontal, on which fill or compacted backfill is to be placed, shall be stepped in such a manner that the compaction equipment will bear on the full depth of the layer.

3.15.1.1 Foundation Preparation, Rock Abutments

In the case of exposed rock surfaces at an abutment, detached rock blocks and loose surface material shall be removed. The use of heavy, tracked equipment shall be minimized to protect the in situ rock surfaces. Excavation and cleaning of the abutment may result in exposure of natural bedding planes and joints thereby creating "steps" on the abutment. Large rock overhangs and protrusions shall be removed by the use of pre-splitting or line drilling techniques in such a manner as to minimize damage to the underlying rock, or the spaces beneath overhangs and around protrusions shall be filled with tamped concrete so that satisfactory compaction of embankment materials can be accomplished. Surfaces steeper than 4V:1H shall not be more than 1.0 meter in height, and benches of sufficient width shall be provided as necessary so that the average slope of any rock face is not steeper than 2V:1H. Rough areas that, in the opinion of the Contracting Officer, the compaction of the embankment materials cannot be accomplished satisfactorily with power tampers or other specified compaction equipment shall be filled with mortar or concrete, as directed to the extent necessary, to merit satisfactory use of the compaction equipment. All rock surfaces upon which or against which embankment materials are to be placed shall be broom cleaned. All open joints and cracks greater than 13 mm in width shall be filled with mortar to the depths cleaned. Those portions of such rock surfaces where there are holes greater than 100 mm deep and smaller than 610 mm across shall be filled with mortar or concrete. Mortar and concrete, including forming as necessary, shall conform with the applicable provisions of Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE FOR CIVIL WORKS. In no case shall a thin coat of mortar be left on smooth, intact rock surfaces. Final cleaning of the residual rock surfaces shall take place as the embankment is being

raised. Fill materials shall not be placed against embankment abutments until approved by the Contracting Officer.

3.15.2 PLACEMENT AND COMPACTION, INLET STRUCTURE EMBANKMENT

Each layer of the material shall be compacted to not less than 95 percent of maximum density, per ASTM D 1557. The Contractor shall construct Inlet Structure embankment by placing successive horizontal lifts over the entire plane of the work surface. All fill materials shall be placed parallel to axis of Inlet Structure in compacted horizontal lifts less than 300 mm thickness. Placement of adjacent fills at different heights is prohibited.

Where interim slopes are allowed by the Contracting Officer, the Contractor shall grade slopes flatter than 3H:1V. The Contractor must bench and moisture condition interim slopes immediately prior to placement of each lift of new fill against interim slopes. Whenever a compacted surface of any lift has been made too smooth to bond to successive layer by concentration of hauling equipment or other reasons, the Contractor shall loosen by scarifying or other equivalent methods and moisture condition surface prior to placement of the succeeding lift. The embankment lift surfaces shall be kept moist. If a lift surface dries out and cracks, the Contractor shall moisture condition to specified range and rework the lift prior to placement of the subsequent lift. Finished surfaces shall be overbuilt and cut to final grade.

3.15.3 Compacted Fill For RCB Outlet Conduit

3.15.3.1 Compaction

Each layer of the material shall be compacted to not less than 95 percent of maximum density, per ASTM D 1557, and shall be in accordance with paragraph PLACEMENT AND COMPACTION, INLET STRUCTURE EMBANKMENT and in accordance with paragraph LIMITATIONS ON EQUIPMENT, RCB OUTLET CONDUIT. Contractor shall utilize paragraph SUBGRADE FOR RCB OUTLET CONDUIT prior to installation of the RCB outlet conduit.

3.15.3.2 SUBGRADE FOR RCB OUTLET CONDUIT

Subgrade preparation for RCB outlet conduit shall include subgrade preparation for areas to receive concrete for RCB outlet conduit. All trash and debris shall be removed in accordance with Section 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS. After the RCB outlet conduit alignment has been excavated to rough grade, the entire RCB outlet conduit invert shall be scarified to a depth of 0.15 meters, moisture conditioned and proofrolled by 4 passes of the compaction equipment and trimmed to a uniform grade and smoothed with a steel-wheeled roller to make the subgrade ready to receive concrete. If the subgrade is disturbed by the Contractor's operations or is overexcavated, or is soft or yielding, the subgrade shall be restored to grade and compacted to a density of 95 percent of maximum density, per ASTM D 1557. The finished surface of the subgrade shall not be more than 13 mm above the indicated grade at any point when tested with a 3 meters straightedge.

3.15.3.3 LIMITATIONS ON EQUIPMENT, RCB OUTLET CONDUIT

The gross weight of any piece of equipment, or the combined weight of any combinations of equipment coupled together, used to place, moisten and/or compact fill along the sides of the RCB outlet conduit and up to 600 mm above the top of the RCB outlet conduit shall not exceed 16,000 kilograms, including dynamic forces produced by vibratory equipment. Equipment used to compact the fill along the sides and above the top of the RCB outlet conduit shall be of such size as to be capable of operating in the area between the cut slope and the RCB outlet conduit. Compaction equipment will be required to operate at elevations equivalent to the elevation of the bottom of the invert of the RCB outlet conduit. This equipment shall be of such size as to be capable of operating in the area between the cut slope and the RCB outlet conduit.

3.15.4 Settlement

The Contractor shall delay RCC placement for a maximum settlement period of 60 days after embankment in that area reaches full height in order to monitor anticipated settlement of the embankment. The Contractor shall install two surface settlement monuments, one each at STA 00+60.000, and STA 1+20.000 for the Inlet Structure Embankment; the locations with respect to the Inlet Structure centerline will be determined by the Contracting Officer.

3.15.5 Settlement Monitoring

The monuments shall be surveyed by the Contractor within 24 hours of installation and the elevation surveyed on a weekly basis. The survey data shall be provided to the Contracting Officer for review to determine the need for further monitoring. If the survey data indicates there is inconsequential settlement, the Contracting Officer may approve RCC placement before the 60 day settlement period expires. A settlement monument plan including typical details of the surface settlement monuments along with the plan to protect the monument during construction shall be provided by the Contractor for review not less than 14 calendar days prior to installation of the monument.

3.15.6 Settlement Monument Protection Plan

The location of the settlement monument shall be clearly marked and readily visible (red flagged) to equipment operators. In the event of damage to settlement monument or extension resulting from equipment operating within the specified area, the Contractor shall immediately notify the Contracting Officer and shall be responsible for restoring the settlement monument to working order.

3.15.7 Regrading of Embankment Crest

If the Inlet Structure embankment crest settles, the embankment shall be regraded to the lines and grades indicated after the settlement period is completed.

3.15.8 Basin

3.15.8.1 Location

Compacted fill for the basin shall consist of small amount of fill associated with the detention basin grading and access roads to be placed outside of the Inlet Structure embankment footprint. This quantity shall not be measured for payment but shall be considered incidental to basin excavation.

3.15.8.2 Preparation for Placing

The foundation for the compacted fill to be placed in the basin shall be cleared of all existing obstructions, vegetation and debris. Any trash or debris shall be removed in accordance with SECTION 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS and with this section. Unsuitable materials or unstable (too wet) not meeting the requirements for fill material shall be removed where directed. The existing surfaces for compacted fill in the basin shall be scarified to a depth of 0.15 meters and proofrolled by four passes of the compaction equipment.

3.15.8.3 Compaction

Each layer of the material shall be compacted to not less than 90 percent of maximum density, per ASTM D 1557.

3.16 BACKFILL

3.16.1 Structural Backfill

3.16.1.1 Location

Backfill shall consist of all fill against and/or around structures, except compacted fill, channel.

3.16.1.2 Material

Backfill material shall be obtained from the required excavation as approved by the Contracting Officer. In general, the best material available will be designated as backfill and fill about structures. Backfill may consist of sand, gravelly sand, and silty sands. Organic material, silt, clay, broken concrete or pavement, boulders and other unsatisfactory material shall not be used. Backfill for structures shall not contain any stones larger than 75 mm.

3.16.1.3 Placing

Backfill material shall not be placed against concrete which has not been in place at least 14 days or until the concrete has attained a strength of 17.2 megapascals when tested in accordance with Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.16.1.4 Compaction

Compaction shall be not less than 95 percent of maximum density, per ASTM D 1557 unless noted or shown otherwise.

3.17 SUBGRADE PREPARATION

3.17.1 Subgrade for Channel

Subgrade preparation for channel shall include subgrade preparation for areas to receive concrete, aggregate base course and/or bituminous paving for streets, access roads, maintenance roads, turnarounds, and invert access ramps. All trash and debris shall be removed in accordance with Section 02230 CLEAR SITE AND REMOVE OBSTRUCTIONS. After the channel has been excavated to rough grade, the entire channel invert, invert access ramp, and other area indicated above shall be scarified to a depth of 0.15 meters, moisture conditioned and proofrolled by 4 passes of the compaction equipment and trimmed to a uniform grade and smoothed with a steel-wheeled roller to make the subgrade ready to receive concrete. If the subgrade is disturbed by the Contractor's operations or is overexcavated, or is soft or yielding, the subgrade shall be restored to grade and compacted to a density of 95 percent of maximum density, per ASTM D 1557. The finished surface of the subgrade shall not be more than 13 mm above the indicated grade at any point when tested with a 3 meters straightedge.

3.18 SOIL STABILIZER

All exposed excavation and fill surfaces and disturbed surface areas in the project area not covered by concrete or asphalt or landscaping work including revegetation shall be treated with a soil stabilizer for soil stabilization and dust control with the concentrations stated in paragraph SOIL STABILIZER PRODUCT after construction is completed. The soil stabilizer shall be watered in per the manufacturer's recommendations.

Processed gypsum that has become partially air set, lumpy, or caked shall not be used. The plaster/cellulose fiber mulch shall be applied at a rate of 6.75 tonnes of plaster mixed with 2.242 tonnes of fiber per hectare.

The plaster/cellulose fiber mulch stabilizer shall formulate a protective crust-like barrier within 4 to 8 hours after application. Application of the plaster/cellulose fiber mulch stabilizer shall not be permitted when weather conditions are unsuitable for concrete placement in accordance with Section 03301 CAST-IN-PLACE STRUCTURAL CONCRETE.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02821

FENCING AND RAILING

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 TORTOISE FENCING
 - 2.1.3 Woven Wire and Wire Netting
- 2.2 GATES
- 2.3 METAL POSTS FOR CHAIN LINK FENCE, TORTOISE FENCE, AND POST AND CABLE RAILING
 - 2.3.1 METAL POSTS FOR CHAIN LINK FENCE
 - 2.3.2 Metal Posts for Post and Cable Railing
 - 2.3.3 Metal Tee Posts For Tortoise Fencing
- 2.4 BRACES AND RAILS
- 2.5 WIRE
 - 2.5.1 Tension Wire
- 2.6 CABLES FOR POST AND CABLE RAILING
- 2.7 ACCESSORIES
- 2.8 CONCRETE
- 2.9 PADLOCKS
- 2.10 GROUND RODS
- 2.11 Ornamental Metal Fencing System
 - 2.11.1 Material, General
 - 2.11.1.1 Pickets, rails, posts

PART 3 EXECUTION

- 3.1 INSTALLATION
- 3.2 EXCAVATION
- 3.3 POST INSTALLATION, CHAIN LINK METAL FENCE AND GATES
 - 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

- 3.10 POST AND CABLE RAILING SYSTEM INSTALLATION
 - 3.10.1 Posts for Post and Cable Railing
 - 3.10.2 Cables for Post and Cable Railing
 - 3.10.3 After Installation
- 3.11 TORTOISE FENCING INSTALLATION
- 3.12 ORNAMENTAL METAL FENCES AND GATES
 - 3.12.1 GENERAL INSTALLATION FOR ORNAMENTAL METAL FENCES AND GATES
 - 3.12.2 EXCAVATION FOR ORNAMENTAL METAL FENCES AND GATES
 - 3.12.3 INSTALLATION FOR ORNAMENTAL METAL FENCE POST
 - 3.12.3.1 Posts for Ornamental Metal Fences and Gates in Soil and or Rock
 - 3.12.3.2 Posts for Ornamental Metal Fences and Gates in Concrete Wall
 - 3.12.4 CROSS MEMBERS
 - 3.12.4.1 Top Cross Member
 - 3.12.4.2 Bottom Cross Member
 - 3.12.5 VERTICAL METAL PICKETS
 - 3.12.6 ORNAMENTAL METAL FENCE GATE INSTALLATION
 - 3.12.7 GROUNDING FOR ORNAMENTAL METAL FENCES AND GATES
 - 3.12.8 OPERATION FOR ORNAMENTAL METAL FENCES AND GATES

-- End of Section Table of Contents --

SECTION 02821

FENCING AND RAILING

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.

ASTM INTERNATIONAL (ASTM)

ASTM A 116	(2000) Metallic-Coated, Steel Woven Wire Fence Fabric
ASTM A 123/A 123M	(2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(2001a) Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A 392	(1996) Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A 475	(1998) Zinc-Coated Steel Wire Strand
ASTM A 491	(1996) Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A 501	(1999) Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
ASTM A 653/A 653M	(2002a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 780	(2001) Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
ASTM A 824	(2001) Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link Fence
ASTM B 32	(2000e1) Solder Metal
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM C 94/C 94M	(2000e2) Ready-Mixed Concrete
ASTM C 270	(2002) Mortar for Unit Masonry

ASTM C 476	(1999) Grout for Masonry
ASTM F 626	(1996a) Fence Fittings
ASTM F 883	(1997) Padlocks
ASTM F 900	(2000) Industrial and Commercial Swing Gates
ASTM F 1043	(2000) Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework
ASTM F 1083	(1997) Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F 1184	(1994; R 2000) Industrial and Commercial Horizontal Slide Gates

UNDERWRITERS LABORATORIES (UL)

UL 467	(1993; Rev thru Aug 2001) Grounding and Bonding Equipment
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The "RE" designates that the Resident Office will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Post and Cable Railing System.

Chain Link Metal Fence and Gates.

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: Post and Cable railing system, chain link metal fences and gates.

Ornamental Metal Fencing System.

Manufacturer's literature on ornamental metal fencing system shall be submitted prior to installation.

SD-07 Certificates

Chain Link Fence.

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. In the event the plans or drawings indicate 11 gauge wire, the Contractor shall use 9 gauge wire as specified herein. Fabric height shall be 1.83 meters. Fabric shall be twisted and barbed on the top selvage and knuckled on the bottom selvage.

2.1.2 TORTOISE FENCING

Tortoise fencing shall be temporary and shall consist of a 1.219 meter high, 1/2" galvanized mesh, or equivalent, with steel tee posts driven into the ground, or with steel tee posts set in excavated holes with mortar and grout as necessary, installed where shown on the drawings or required by the Contracting Officer. Mortar and grout to set steel tee posts in holes as necessary shall conform to ASTM C 270 Type M and ASTM C 476.

2.1.3 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 METAL POSTS FOR CHAIN LINK FENCE, TORTOISE FENCE, AND POST AND CABLE RAILING

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.

2.3.2 Metal Posts for Post and Cable Railing

Posts for Post and Cable Railing shall be per ASTM A 501 and shall be hot-dip galvanized after drilling holes, welding, and other fabrication as shown on the drawings. Galvanizing shall be in accordance with ASTM A 123/A 123M, as applicable. Welded, cut, damaged, and deformed areas of galvanizing metal shall be neatly coated with Grade 50B solder conforming to ASTM B 32.

2.3.3 Metal Tee Posts For Tortoise Fencing

Steel tee posts shall be similar to those found commercially available, adjusted to the height of the tortoise fence fabric.

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, 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 CABLES FOR POST AND CABLE RAILING

Cables shall be prestretched, galvanized wire rope of the size indicated, ungreased. Wire rope shall conform to ASTM A 475, high strength grade with Class A coating. Fittings and accessories shall be hot-dip galvanized.

2.7 ACCESSORIES

Fence fittings and accessories shall be per ASTM F 626 and as shown on the drawings. 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. For the Post and Cable Railing system the turnbuckles, eyebolts, anchors, u-bolt clips, nuts and washers shall be galvanized or zinc plated.

2.8 CONCRETE

ASTM C 94/C 94M, 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.

2.9 PADLOCKS

Padlocks shall conform to ASTM F 883, Type P01 Grade 2, Size 44 mm (1-3/4 inch). Padlocks shall be a combination commercial type Padlock Master #175 or equivalent.

2.10 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.

2.11 Ornamental Metal Fencing System

2.11.1 Material, General

The ornamental metal fencing system shall be similar or equivalent to AEGIS II, Classic 2-Rail. The materials for fence framework (including but not limited to pickets, rails, and posts) shall be manufactured from coil steel having a minimum yield strength of 350 Mpa. The steel shall be galvanized to meet the requirements of ASTM A 653/A 653M with a minimum zinc coating weight of 277 grams per square meter (coating Designation G-90), hot-dip process. Galvanized framework shall be subject to a six stage pretreatment/wash (with zinc phosphate) followed by "Permacoat" or equivalent, an electrostatic spray application of a two-coat powder system.

The base coat is a thermosetting epoxy powder coating (gray color) with a minimum thickness of 1 mm. The top coat is a "No-mar" TGIC or similar polyester powder coat finish with a minimum thickness of 1 mm. The color shall be desert sand. Coated galvanized framework shall have a salt spray resistance of 3,500 hours using ASTM B 117 without loss of adhesion.

2.11.1.1 Pickets, rails, posts

Fence pickets shall be 2.54 cm square x 16 gauge tubing. The cross-sectional shape of the rails shall conform to the "Forerunner" or similar or equivalent with outside cross-section dimensions of 44.45 mm square and a minimum thickness of 14 gauge. Post spacing shall be 2.44 m

on center with 63.5 mm square posts. Picket holes in the rail shall be spaced 126 mm on center. Picket retaining rods shall be 3.18 mm diameter galvanized steel. Posts shall be a minimum of 63.5 mm square x 12 gauge. Rubber grommets shall be supplied to seal all picket-to-rail intersections.

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. 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. 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, CHAIN LINK METAL FENCE AND GATES

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 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 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 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. Group II line posts may be mechanically driven, for temporary fence construction only, if rock is not encountered. Driven posts shall be set to a minimum depth of 914 mm and shall be protected with drive caps when being set.

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 in height. A center brace or 2 diagonal truss rods shall be installed on 3.66 m 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 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 102 mm of the installed fabric. Bottom tension wire shall be installed within the bottom 152 mm 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 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 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. Contractor shall provide a padlock for each of the chain link fence gate assemblies.

3.9 GROUNDING

Fences crossed by power lines 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 by 3.05 m long copper-clad steel rod. Electrodes shall be driven into the earth so that the top of the electrode is at least 152 mm 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 and electrodes with bronze grounding clamps to create electrical continuity between fence posts, fence fabric, and ground rods. After installation the total resistance of fence to ground shall not be greater than 25 ohms.

3.10 POST AND CABLE RAILING SYSTEM INSTALLATION

3.10.1 Posts for Post and Cable Railing

Posts for Post and Cable Railing shall be installed as shown on the drawings. All posts for the post and cable railing installation shall be true vertical or plumb and not normal to the top of the channel walls.

3.10.2 Cables for Post and Cable Railing

Cables for the post and cable railing shall be installed as shown in the drawings. Cables shall be pulled taut and shall be free of sag. Cables shall be parallel to the top of the channel wall.

3.10.3 After Installation

The Contractor shall examine and certify the operation of all post and cable railing not sooner than 30 days after installation.

3.11 TORTOISE FENCING INSTALLATION

Installation of the tortoise fence, temporary, shall be in accordance with the manufacturer recommendations. Shop drawings submittal (including steel tee post selection) of the tortoise fence is required and shall be approved by the Contracting Officer prior to installation. Steel tee posts for the tortoise fencing shall be driven plumb in the ground or as necessary shall be set plumb in holes formed in the ground and grouted into place. The grout shall be thoroughly consolidated around each steel tee post so as to be free of voids and finished to form a dome. The 1/2" galvanized mesh shall have the bottom portion buried 12" deep or bent over 12" with rocks/dirt placed on same. The Contractor shall maintain the tortoise fence throughout the life of the project. The tortoise fencing shall be removed in its entirety at the end of the contract, and the post holes backfilled to surrounding ground height. The Contractor may bury the bottom portion of the tortoise fence fabric into the ground as shown on the drawings or as an option may bend the fabric laying it on the ground and covering same with earth.

3.12 ORNAMENTAL METAL FENCES AND GATES

3.12.1 GENERAL INSTALLATION FOR ORNAMENTAL METAL FENCES AND GATES

All new installation shall be laid out by the Contractor in accordance with the drawings. Ornamental metal fences and gates shall be installed to the lines and grades indicated. The area on either side of the ornamental metal fence line shall be cleared to the extent indicated. Line or fence posts shall be spaced equidistant at intervals not exceeding 2.44 meters (8.0 feet) on center as per drawings. Terminal (corner, and gate) posts shall be set at abrupt changes in vertical and horizontal alignment. Metal cross members and vertical pickets shall be continuous installation between posts. Any damage to galvanized surfaces, including welding, cutting or deformed area of galvanizing metal shall be repaired with paint containing zinc dust in accordance with ASTM A 780 or shall be neatly coated with Grade 50B solder conforming to ASTM B 32. Earthwork shall be accomplished per Section 02300, EARTHWORK. Concrete shall be conform to applicable portions of Section 03301, CAST-IN-PLACE STRUCTURAL CONCRETE.

3.12.2 EXCAVATION FOR ORNAMENTAL METAL FENCES AND GATES

Ornamental metal fence and gate post holes excavated in soil and or rock shall be cleared of loose material. Waste material shall be spread where directed. The ground surface irregularities along the metal fence line shall be eliminated to the extent necessary to maintain a 150 mm clearance between the bottom of the metal pickets and finish grade.

3.12.3 INSTALLATION FOR ORNAMENTAL METAL FENCE POST

3.12.3.1 Posts for Ornamental Metal Fences and Gates in Soil and or Rock

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 900 mm (36 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 900 mm (36 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, for the square tube it is the largest diagonal distance. 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.

3.12.3.2 Posts for Ornamental Metal Fences and Gates in Concrete Wall

Posts shall be set plumb and in alignment. Posts shall be set in concrete wall to the depth indicated on the drawings. All portions of posts set in concrete wall shall be grouted. Posts set in concrete shall be set in holes not less than the diameter shown on the drawings. Diameters of holes in concrete wall shall be lined with a steel sleeve installed prior to concrete placement, and the steel sleeve shall be at least 25 mm (1 inch) greater than the largest cross section of the post, for the square tube it

is the largest diagonal distance. 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.

3.12.4 CROSS MEMBERS

3.12.4.1 Top Cross Member

Top rail shall be supported at each post by welding as shown in the drawings.

3.12.4.2 Bottom Cross Member

The bottom cross member shall be supported at each post by welding as shown in the drawings.

3.12.5 VERTICAL METAL PICKETS

Vertical metal pickets shall be installed as shown on the drawings, **and shall be installed true vertical**. The bottom of the vertical metal pickets shall be **50 mm (2 inches)** above the ground.

3.12.6 ORNAMENTAL METAL FENCE GATE INSTALLATION

Ornamental metal fence 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.

3.12.7 GROUNDING FOR ORNAMENTAL METAL FENCES AND GATES

Except as indicated below, ornamental 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 electrically continuous with the fencing.

- a) Metal fences crossed by overhead powerlines in excess of 600 volts shall be grounded. Metal fence systems 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.

3.12.8 OPERATION FOR ORNAMENTAL METAL FENCES AND GATES

The Contractor shall examine and certify the operation of all ornamental metal fences and gates not sooner than 30 days after installation.

-- End of Section --