CANADIAN RIVER MUNICIPAL WATER AUTHORITY CORPORATION

Lake Meredith Salinity Control Project - Bid Package 2

SPECIFICATIONS AND CONTRACT DOCUMENTS
FOR CONSTRUCTION OF

SALINITY CONTROL FACILITIES

May 2000

Executive Committee

E.R. MOORE — ***President***
NORMAN WRIGHT — ***Vice President***

General Manager and Secretary-Treasurer
JOHN C. WILLIAMS

Administration Officer and Assistant Secretary
BUDDY TRENT

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CANADIAN RIVER MUNICIPAL WATER AUTHORITY CORPORATION
SALINITY CONTROL FACILITIES

SECTION 1

INVITATION TO BID

INVITATION FOR BIDS

The Canadian River Municipal Water Authority Corporation (CRMWA Corp.) is soliciting bids for performance of the following work:

Construction of Salinity Control Facilities
LAKE MEREDITH SALINITY CONTROL PROJECT
(10,400 ft of pipe, 11 Production wells, Operations facility, Storage tanks, SCADA system, Plug 10 wells)

Bids for this work will be received at the offices of the Canadian River Municipal Water Authority, located at Sanford Dam, one mile west of Sanford, Texas, until 2:00 PM on **May 23rd , 2000.** Bids will then be publicly opened in the CRMWA Board Room and read aloud. Bids received after the time for opening will be returned unopened. Address all bids to the General Manager, CRMWA Corp. If submitted by mail, send bids to Post Office Box 9, Sanford, Texas 79078. Bids delivered by Federal Express or other delivery service should be addressed to CRMWA Corp. at Water Authority Road, one mile west of Sanford, Sanford, Texas 79078. Bids must be submitted in a sealed envelope, marked with the name of the Project, and the phrase "SEALED BID" clearly marked on the envelope.

Specifications and contract documents may be obtained by contacting the General Manager, CRMWA Corp., Post Office Box 9, Sanford, Texas, or by calling 806-865-3325. A $50.00 deposit should be made payable to CRMWA Corp. for each set of plans and specifications.

All bids must be accompanied by bid security in the form of a cashiers check or acceptable bid bond, payable to CRMWA Corp., in an amount equal to five percent (5%) of the amount of the bid, to guarantee that the Bidder will enter into a contract with CRMWA Corp. within fifteen days if awarded the contract.

SECTION 2

INSTRUCTION TO BIDDERS

INSTRUCTIONS TO BIDDERS

1. PREPARATION OF BIDS.

   1.1 Bidders are expected to examine the site of the work, the drawings, specifications, bid form, and all instructions. By the offer of his bid, the Contractor will be understood to have certified that he has examined the site of the construction, its means of access, as well as the location of the material and the routes over which it must be transported to the locations of the work.

   1.2 Each bidder shall furnish the information required by the bid form. The bidder shall print or type his name on the bid form and each Continuation Sheet thereof on which he makes an entry. Erasures or other changes must be initialed by the person signing the bid. Bids signed by an agent must be accompanied by evidence of his authority.

   1.3 Unreasonable (or "unbalanced") unit prices will authorize the rejection of any bid.

2. TAXES - See Clause 31 of General Conditions.

3. SUBMISSION OF BIDS.

   3.1 Bids and modifications thereof shall be enclosed in sealed envelopes addressed to the issuing office, with the name and address of the bidder, the date and hour of opening, and the invitation number on the face of the envelope. Faxed bids will not be considered; however, bids may be modified by faxed notice provided such notice is received prior to the time set for the opening of the bids.

   3.2 In the event no bid is to be submitted, do not return the invitation unless otherwise specified.

4. WITHDRAWAL OF BIDS.

   Bids may be withdrawn by written or fax notice received before the time set for opening.

5. LATE BIDS.

   Bids and modifications or withdrawals thereof received after the time set for opening will not be considered.

6. CRMWA CORP FURNISHED PROPERTY.

No material, labor, or facilities will be furnished by CRMWA Corp unless otherwise provided for in the Invitation or Specifications.

7. EVALUATION AND AWARD OF CONTRACT

7.1 The contract will be awarded to that responsible bidder whose bid whose bid, conforming to the Invitation for Bids, will be most advantageous to CRMWA Corp, price and other factors considered.

7.2 CRMWA Corp reserves the right to reject any or all bids and to waive formalities and minor irregularities in bids received.

7.3 CRMWA Corp may accept any item or group of items of any bid, unless the bidder qualifies his bid by specific limitations.

SECTION 3

BID FORM

BID FORM

PROJECT IDENTIFICATION

Salinity Control Facilities

THIS BID IS SUBMITTED TO:

Canadian River Municipal Water Authority Corporation
John C. Williams, P.E., General Manager
P.O. Box 9
Sanford, Texas 79078

1. The undersigned BIDDER proposes and agrees, if this bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this bid and in accordance with other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for sixty (60) days after the day of Bid opening. BIDDER will sign and deliver the required number of counterparts of the Agreement with the Bonds, insurance, and other documents required by the Bidding Requirements within fifteen (15) days after the date of OWNER's Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   a. BIDDER has examined and carefully studied the Bidding Documents and the following Addenda receipt of all which is hereby acknowledged: (List Addenda by Addendum Number and Date)

   _____

   _____

   _____

   b. BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work;

   c. BIDDER is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.

   d. BIDDER acknowledges that OWNER and Project Supervisor do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques,

sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the determinations of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.

e. BIDDER is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this bid is submitted as indicated in the Contract Documents.

f. BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

g. BIDDER has given Project Supervisor written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by Project Supervisor is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantages over any other Bidder or over OWNER.

4. BIDDER will complete the Work in accordance with the Contract Documents for the following price(s):

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

1. BASE BID

Item No.	Description	Quantity	Unit	Unit Price	Bid Amount
1	Mobilization	1	LS		
2	Care and Diversion of River	1	LS		
3	Injection Well Facility	1	LS		
4	Access Road	1	LS		
5	Plateau 8" DR 17.0 Discharge Line	1598	LF		
6	Plateau 6" DR 17.0 Discharge Line	4042	LF		
7	Plateau 6" DR 15.5 Discharge Line	987	LF		
8	Valley 6" DR 15.5 Discharge Line	243	LF		
9	Valley 6" DR 13.5 Discharge Line	3555	LF		
10	Angle Drilled Discharge Line	1	LS		
11	East Branch Bore Under SH469	1	LS		
12	West Branch Bore Under SH469	1	LS		
13	Valley 4" DR 11.0 (PW to Mainline)	670	LF		
14	Plateau Vault	5	EA		
15	Valley Vault	2	EA		
16	Production Vault & Controls (5-Valley)	1	LS		
17	Production Vault & Controls (1-Plateau)	1	LS		
18	Mobilization & Demobilization of Drilling Rig	1	LS		
19	Location Preparation - 5 Valley Wells	5	EA		
20	Location Preparation - 1 Plateau Well	1	EA		
21	Furnish & Install 16-inch Conductor Casing - 5 Valley Wells (total footage-all valley wells)	255	LF		
22	Furnish & Install 16-inch Casing-Head Flange - 5 Valley Wells	5	EA		
23	Drill 10-inch Hole to 15 feet; Furnish, Install, & Cement 16-inch Conductor Casing - 1 Plateau Well	15	LF		
24	Furnish & Install 16-inch Casing-Head Flange - 1 Plateau Well	1	EA		
25	Drill 6 Holes with Minimum 14-3/4-inch Diameter to Total Depth - 5 Valley Wells & 1 Plateau Well (total footage - all wells)	816	LF		
26	Furnish & Install 6-inch OD PVC Blank Pipe - Valley Wells & Plateau Well (total footage - all wells)	60	LF		
27	Furnish & Install 6-inch OD PVC Screen - Valley Wells & Plateau Well (total footage - all wells)	300	LF		
28	Furnish & Install 8-inch OD PVC Riser - Valley Wells & Plateau Well	516	LF		

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

1. BASE BID (Cont.)

Item No.	Description	Quantity	Unit	Unit Price	Bid Amount
29	Furnish & Install Filter Pack - Valley Wells & Plateau Well (total cu. ft. - all wells)	396	CF		
30	Furnish & Install Bentonite Seal - Valley Wells & Plateau Well (total cu. ft. - all wells)	48	CF		
31	Furnish & Install Cement-Bentonite Grout Slurry Between 8-inch PVC and 14-3/4-inch Hole and 16-inch Conductor Pipe - Valley Wells & Plateau Well (total cu. ft. - all wells)	368	CF		
32	Furnish Pump for Well Development - Develop Well - 5 Valley Wells & 1 Plateau Well (total hours)	48	HR		
33	Furnish Pump for Well Productivity Testing - Run Production Test on Each Well - 5 Valley Wells & 1 Plateau Well (total hours)	48	HR		
34	Furnish Pump for Formation Water Sampling. Collect Water Samples from Each Well - 5 Valleys & 1 Plateau Well (total hours)	36	HR		
35	Laboratory Analysis of Formation Water from Each Well - 5 Valley Wells & 1 Plateau Well	6	EA		
36	Furnish Pump and Related Data Acquisition Equipment for Aquifer Testing - 5 Valley Wells & 1 Plateau Well (total hours)	324	HR		
37	Furnish and Install Fiberglass Production Tubing - 5 Valley Wells & 1 Plateau Well (total footage - all wells)	520	LF		
38	Furnish & Install Production Pump - 5 Valley Wells & 1 Plateau Well	6	EA		
39	Furnish & Install Wellhead - 5 Valley Wells & 1 Plateau Wel	6	EA		
40	Furnish & Install Electrical Tubing, Water Level Probe, & Instrumentation Cable - 5 Valley Wells & 1 Plateau Well	6	EA		
41	Outlet Works and Vault	2	EA		
42	4" DR 11.0 to Outlet Works	30	LF		
43	P&A TW #1 (including perforating)	1	LS		
44	P&A OW #1	1	LS		
45	P&A OW #2 (including perforating)	1	LS		
46	P&A OW #3	1	LS		
47	P&A OW #4	1	LS		
48	P&A OW #7	1	LS		
49	P&A OW #8	1	LS		
50	P&A DH #1	1	LS		
51	P&A DH #2	1	LS		
52	P&A DH #3	1	LS		
53	Pull/drill PVC string and bushing in OW #7 and OW #8	16	HR		
54	Redrill caved hole in DH #1 and DH #2	495	FT		
	Total Base Bid Items ___ to ___				

The total bid price for all items included in Bid Package 2 shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. All work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility and other pay items as listed above. The Contractor shall furnish the injection well facility and the related piping and well system as a complete and operable facility.

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

2. ADD ALTERNATE PW 2-1

Item No.	Description	Quantity	Unit	Unit Price	Bid Amount
1	PW 2-1, Production Vault & Controls	1	LS		
2	4" DR 11.0 Pipe	850	LF		
3	6"x6"x4" Tee	1	EA		
4	Location Preparation	1	LS		
5	Furnish & Install 16-inch Conductor Casing	30	LF		
6	Furnish & Install 16-inch Casing-Head Flange	1	EA		
7	Furnish & Install Vaults	1	EA		
8	Drill 6 Holes with Minimum 14-3/4-inch Diameter to Total Depth	112	LF		
9	Furnish & Install 6-inch OD PVC Blank Pipe	10	LF		
10	Furnish & Install 6-inch OD PVC Screen	48	LF		
11	Furnish & Install 8-inch OD PVC Riser	83	LF		
12	Furnish & Install Filter Pack	66	CF		
13	Furnish & Install Bentonite Seal	8	CF		
14	Furnish & Install Cement-Bentonite Grout Slurry Between 8-inch PVC & 14-3/4-inch Hole & 16-inch Conductor Pipe	60	CF		
15	Furnish Pump for Well Development - Develop Well	8	HR		
16	Furnish Pump for Well Productivity Testing - Run Production Test on Each Well - Valley Wells	8	HR		
17	Furnish Pump for Formation Water Sampling. Collect Water Samples from Each Well	6	HR		
18	Laboratory Analysis of Formation Water from Each Well	1	EA		
19	Furnish Pump & Related Data Acquisition Equipment for Aquifer Testing	54	HRS		
20	Furnish & Install Fiberglass Production Tubing	85	LF		
21	Furnish & Install Production Pump	1	EA		
22	Furnish & Install Wellhead	1	EA		
23	Furnish & Install Electrical Tubing, Water Level Probe, & Instrumentation Cable	1	EA		
	Total Add Alternate PW 2-1				

Determination of the apparent low bidder will be made by taking each bidders base bid and adding as many of the additives (taken in the sequence listed) as available funds will permit.

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

3. ADD ALTERNATE PW 2-2

tem No.	Description	Quantity	Unit	Unit Price	Bid Amount
1	Production Vault & Controls	1	LS		
2	4" DR 11.0 Pipe	700	LF		
3	6" DR 11.0 Pipe	3149	LF		
4	6"x6"x4" Tee	1	EA		
5	Location Preparation	1	LS		
6	Furnish & Install 16-inch Conductor Casing	30	LF		
7	Furnish & Install 16-inch Casing-Head Flange	1	EA		
8	Furnish & Install Vaults	1	EA		
9	Drill 6 Holes with Minimum 14-3/4-inch Diameter to Total Depth	112	LF		
10	Furnish & Install 6-inch OD PVC Blank Pipe	10	LF		
11	Furnish & Install 6-inch OD PVC Screen	48	LF		
12	Furnish & Install 8-inch OD PVC Riser	83	LF		
13	Furnish & Install Filter Pack	66	CF		
14	Furnish & Install Bentonite Seal	8	CF		
15	Furnish & Install Cement-Bentonite Grout Slurry Between 8-inch PVC & 14-3/4-inch Hole & 16-inch Conductor Pipe	60	CF		
16	Furnish Pump for Well Development - Develop Well	8	HR		
17	Furnish Pump for Well Productivity Testing - Run Production Test on Each Well - Valley Wells	8	HR		
18	Furnish Pump for Formation Water Sampling. Collect Water Samples from Each Well	6	HR		
19	Laboratory Analysis of Formation Water from Each Well	1	EA		
20	Furnish Pump & Related Data Acquisition Equipment for Aquifer Testing	54	HR		
21	Furnish & Install Fiberglass Production Tubing	85	LF		
22	Furnish & Install Production Pump	1	EA		
23	Furnish & Install Wellhead	1	EA		
24	Furnish & Install Electrical Tubing, Water Level Probe, & Instrumentation Cable	1	EA		
	Total Add Alternate PW 2-2				

Determination of the apparent low bidder will be made by taking each bidders base bid and adding as many of the additives (taken in the sequence listed) as available funds will permit.

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

4. ADD ALTERNATE PW 2-3

tem No.	Description	Quantity	Unit	Unit Price	Bid Amount
1	Production Vault & Controls	1	LS		
2	4" DR 11.0 Pipe	15	LF		
3	6" DR 11.0 Pipe	858	LF		
4	6"x6"x4" Tee	1	EA		
5	Location Preparation	1	LS		
6	Furnish & Install 16-inch Conductor Casing	30	LF		
7	Furnish & Install 16-inch Casing-Head Flange	1	EA		
8	Furnish & Install Vaults	1	EA		
9	Drill 6 Holes with Minimum 14-3/4-inch Diameter to Total Depth	112	LF		
10	Furnish & Install 6-inch OD PVC Blank Pipe	10	LF		
11	Furnish & Install 6-inch OD PVC Screen	48	LF		
12	Furnish & Install 8-inch OD PVC Riser	83	LF		
13	Furnish & Install Filter Pack	66	CF		
14	Furnish & Install Bentonite Seal	8	CF		
15	Furnish & Install Cement-Bentonite Grout Slurry Between 8-inch PVC & 14-3/4-inch Hole & 16-inch Conductor Pipe	60	CF		
16	Furnish Pump for Well Development - Develop Well	8	HR		
17	Furnish Pump for Well Productivity Testing - Run Production Test on Each Well - Valley Wells	8	HR		
18	Furnish Pump for Formation Water Sampling. Collect Water Samples from Each Well	6	HR		
19	Laboratory Analysis of Formation Water from Each Well	1	EA		
20	Furnish Pump & Related Data Acquisition Equipment for Aquifer Testing	54	HR		
21	Furnish & Install Fiberglass Production Tubing	85	LF		
22	Furnish & Install Production Pump	1	EA		
23	Furnish & Install Wellhead	1	EA		
24	Furnish & Install Electrical Tubing, Water Level Probe, & Instrumentation Cable	1	EA		
	Total Add Alternate PW 2-3				

Determination of the apparent low bidder will be made by taking each bidders base bid and adding as many of the additives (taken in the sequence listed) as available funds will permit.

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

5. ADD ALTERNATE PW 2-4

tem No.	Description	Quantity	Unit	Unit Price	Bid Amount
1	Production Vault & Controls	1	LS		
2	4" DR 11.0 Pipe	750	LF		
3	6"x6"x4" Tee	1	EA		
4	Location Preparation	1	LS		
5	Furnish & Install 16-inch Conductor Casing	30	FT		
6	Furnish & Install 16-inch Casing-Head Flange	1	EA		
7	Furnish & Install Vaults	1	EA		
8	Drill 6 Holes with Minimum 14-3/4-inch Diameter to Total Depth	112	LF		
9	Furnish & Install 6-inch OD PVC Blank Pipe	10	LF		
10	Furnish & Install 6-inch OD PVC Screen	48	LF		
11	Furnish & Install 8-inch OD PVC Riser	83	LF		
12	Furnish & Install Filter Pack	66	CF		
13	Furnish & Install Bentonite Seal	8	CF		
14	Furnish & Install Cement-Bentonite Grout Slurry Between 8-inch PVC & 14-3/4-inch Hole & 16-inch Conductor Pipe	60	CF		
15	Furnish Pump for Well Development - Develop Well	8	HR		
16	Furnish Pump for Well Productivity Testing - Run Production Test on Each Well - Valley Wells	8	HR		
17	Furnish Pump for Formation Water Sampling. Collect Water Samples from Each Well	6	HR		
18	Laboratory Analysis of Formation Water from Each Well	1	EA		
19	Furnish Pump & Related Data Acquisition Equipment for Aquifer Testing	54	HR		
20	Furnish & Install Fiberglass Production Tubing	85	LF		
21	Furnish & Install Production Pump	1	EA		
22	Furnish & Install Wellhead	1	EA		
23	Furnish & Install Electrical Tubing, Water Level Probe, & Instrumentation Cable	1	EA		
	Total Add Alternte PW 2-4				

Determination of the apparent low bidder will be made by taking each bidders base bid and adding as many of the additives (taken in the sequence listed) as available funds will permit.

LMSCP, BID PACKAGE NO. 2
BID SCHEDULE
MAY, 2000

6. ADD ALTERNATE PW 2-5

Item No.	Description	Quantity	Unit	Unit Price	Bid Amount
1	Production Vault & Controls	1	LS		
2	4" DR 11.0 Pipe	15	LF		
3	6" DR 15.5 Pipe	1458	LF		
4	6"x6"x4" Tee	1	EA		
5	Location Preparation	1	LS		
6	Furnish & Install 16-inch Conductor Casing	30	LF		
7	Furnish & Install 16-inch Casing-Head Flange	1	EA		
8	Furnish & Install Vaults	1	EA		
9	Drill 6 Holes with Minimum 14-3/4-inch Diameter to Total Depth	112	LF		
10	Furnish & Install 6-inch OD PVC Blank Pipe	10	LF		
11	Furnish & Install 6-inch OD PVC Screen	48	LF		
12	Furnish & Install 8-inch OD PVC Riser	83	LF		
13	Furnish & Install Filter Pack	66	CF		
14	Furnish & Install Bentonite Seal	8	CF		
15	Furnish & Install Cement-Bentonite Grout Slurry Between 8-inch PVC & 14-3/4-inch Hole & 16-inch Conductor Pipe	60	CF		
16	Furnish Pump for Well Development - Develop Well	8	HR		
17	Furnish Pump for Well Productivity Testing - Run Production Test on Each Well - Valley Wells	8	HR		
18	Furnish Pump for Formation Water Sampling. Collect Water Samples from Each Well	6	HR		
19	Laboratory Analysis of Formation Water from Each Well	1	EA		
20	Furnish Pump & Related Data Acquisition Equipment for Aquifer Testing	54	HR		
21	Furnish & Install Fiberglass Production Tubing	85	LF		
22	Furnish & Install Production Pump	1	EA		
23	Furnish & Install Wellhead	1	EA		
24	Furnish & Install Electrical Tubing, Water Level Probe, & Instrumentation Cable	1	EA		
	Total Add Alternate PW 2-5				

Determination of the apparent low bidder will be made by taking each bidders base bid and adding as many of the additives (taken in the sequence listed) as available funds will permit.

5. BIDDER agrees that the Work will be completed and ready for final payment in accordance with the General Conditions within TWO HUNDRED SEVENTY (270) calendar days after the date when the Contract Time commence to run.

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.

6. The following documents are attached to and made a condition of this Bid:

   a. Required Bid Security in the form of _____.

   b. A tabulation of Subcontractors, Suppliers and other persons and organizations required to be identified in this bid.

   c. Required BIDDER's Qualification Statement with supporting data.

7. Communications concerning this bid shall be addressed to: The address of Bidder indicated below.

   Name _____

   Address _____

   City, State, Zip _____

   Phone/Fax _____

8. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions or Instructions.

SUBMITTED on _____, 200__.

If BIDDER is:

An Individual

By _____ (SEAL)
(Individuals Name)

doing business as _____

Business address: _____

_____

Phone No.: _____

A Partnership

By _____ (SEAL)
(Firm Name)

_____
(General partner)

doing business as _____

Business address: _____

_____

Phone No.: _____

A Corporation

By _____ (SEAL)
(Corporation Name)

_____
(state of incorporation)

By _____ (SEAL)
(name of person authorized to sign)

_____
(title)

Corporate Seal

Attest

_____
(Secretary)

Business address: _____

_____

Phone No.: _____

A Joint Venture

By _____ (SEAL)
(Name)

_____
(Address)

By _____ (SEAL)
(Name)

_____
(Address)

Phone Number and Address for receipt of official communications

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a part to the joint venture should be in the manner indicated above).

SECTION 4

BONDS

BID BOND

THE STATE OF _____)
)
COUNTY OF _____)

KNOW ALL MEN BY THESE PRESENTS, THAT_____

of the City of _____, County of _____, and State of _____

(hereinafter called the Principal(s), as Principal(s), and _____

_____(hereinafter called the Surety(s), are held and firmly bound unto Canadian River Municipal Water Authority Corporation (CRMWA Corp.), a non-profit corporation of Texas (hereinafter called the Obligee), in the amount of_____

_____DOLLARS, ($_____) for the payment whereof the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted a bid to the Obligee under date of _____, _____, for_____

_____

in response to Invitation No._____.

NOW, THEREFORE, if the Principal, upon acceptance by the Obligee is his bid identified above, within the period specified therein for acceptance (sixty (60) days if no period is specified), shall execute such further contractual documents, if any, and give such bond (s) as may be required by the terms of the bid as accepted within the time specified (ten (10) days if no period is specified) after receipt of the forms by him, or in the event of failure so to execute such further contractual documents and give such bonds, if the Principal shall by the Obligee for any cost of procuring the work which exceeds the amount of his bid, then the above obligation shall be void and of no effect.

BID BOND-CONT'D

Each Surety executing this instrument hereby agrees that its obligation shall not be impaired by any extension(s) of the time for acceptance of the bid that the Principal may grant to CRMWA Corp., notice of which extension(s) to the Surety(ies) being hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

IN WITNESS WHEREOF the said Principal and Surety have signed and sealed this instrument, this _____day of_____, _____.

_____	_____
Principal	Surety
By_____	By_____
Address:_____	Address:_____
_____	_____
_____	_____
(Seal)	(Seal)

Note: Attach Power of Attorney

PAYMENT BOND

THE STATE OF TEXAS)

COUNTY OF HUTCHINSON)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____of the City of _____, County of _____, and State of _____ , hereinafter called Principal, as Principal(s), and _____, a corporation organized and existing under the laws of the State of _____, as Surety, are held and firmly bound unto _____ , hereinafter called Owner, in the amount of _____ (Dollars) ($_____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors, and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered into a certain contract with the Owner, dated the _____day of _____, A.D., _____, to perform the following described work:_____

_____

_____, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein;

NOW, THEREFORE, the condition of this obligation is such that, if the Principal shall promptly make payments to all claimants (as defined in Chapter 2253, Texas Government Code, as amended) supplying labor and materials in the prosecution of the work provided for in said Contract, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

This bond is made and entered into solely for the protection of all claimants supplying labor and material in the prosecution of the work; provided for in said Contract, and all such claimants shall have a direct right of action under the bond as provided in chapter 2253, Texas Government Code. All liabilities on this bond shall be determined in accordance with the provisions of said statutes to the same extent as if they were copied at length herein.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the plans, specifications, or drawings accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder.

PROVIDED FURTHER, that no final settlement between the Owner and Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. Notwithstanding the location at which work may be performed in connection with this bond, the provisions of this bond shall be construed in reference to the Laws of the State of Texas and if any legal action be filed upon this bond, venue shall lie in Hutchinson County, State of Texas.

IN WITNESS WHEREOF this instrument has been executed by the duly authorized representatives of the Principal and Surety.

Signed and sealed this _____day of _____, _____.

_____	_____
Principal	Surety
By:_____	Name:_____
Title:_____	By: _____, Attorney -in-Fact
Address:_____	Address:_____
_____	_____
(Seal)	(Seal)

Note: Attach Power of Attorney for Surety's Attorney-in-Fact

Name and address of the Resident Agency of Surety is:

_____

_____

_____

NOTICE: Surety companies executing this Bond must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

PERFORMANCE BOND

THE STATE OF TEXAS)

COUNTY OF HUTCHINSON)

KNOW ALL MEN BY THESE PRESENTS: THAT we_____ _____ of the City of _____, County of _____, and State of _____, (hereinafter called the Principal, as Principal(s), and _____, a corporation duly organized under the laws of the State of _____, and authorized to issue surety bonds in the State of _____, Surety herein, are held and firmly bound unto _____ (hereinafter called the Owner), in the amount of _____DOLLARS, ($_____) for the payment of which sum we bind ourselves, our heirs, executors, administrators successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Owner, dated the _____day of _____,_____, to perform the following described work: _____ _____ _____, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform the work in accordance with the plans, specifications and contract documents including all and singular the covenants, conditions, and agreements thereof according to the true intent and meaning of said plans, specifications and contract documents, *and shall fully indemnify and save harmless Owner from all costs and damage which Owner may suffer by reason of Principal's default, and reimburse and repay Owner all outlay and expense with Owner may incur in making good such default*; then this obligation shall be void; otherwise, to remain in full force and effect.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same, or any assignment of the contract as may be provided for in the instructions to bidders, shall in anywise affect its obligation on this Bond, and it does waive notice of any such change, extension of time, alteration or addition to the terms of the contract, assignment thereof, or to the work to be performed thereunder.

Notwithstanding the location at which work may be performed in connection with this bond, the provisions of this bond shall be construed in reference to the Laws of the State of Texas and if any legal action be filed upon this bond, venue shall lie in Hutchinson County, State of Texas.

PROVIDED, further that this bond is executed pursuant to Chapter 2253 of the Texas Government Code as amended, and all liabilities on this bond shall be determined in accordance with the provisions of such statute, to the same extent as if t were copied at length herein.

IN WITNESS WHEREOF this instrument has been executed by the duly authorized representatives of the Principal and Surety.

Signed and sealed this _____day of _____, _____.

_____ _____

Principal Surety

By_____ Name:_____

Title:_____ By: _____, Attorney -in-Fact

Address:_____ Address:_____

_____ _____

(Seal) (Seal)

Note: Attach Power of Attorney for Surety's Attorney-in-Fact

Name and address of the Resident Agency of Surety is:

_____

_____

_____

NOTICE: Surety companies executing this Bond must appear on the Treasury Department's most current list (Circular 570 s amended) and be authorized to transact business in the state where the Project is located.

CRMWA Performance Bond

SECTION 5

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT is dated as of the _____ day of _____ in the year 2000 by and between Canadian River Municipal Water Authority Corporation (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

CONTRACTOR shall complete all work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Provide all labor, tools, and equipment for construction of the Salinity Control Facilities as per Contract Documents.

The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

10,400 ft of pipe, 11 Production wells, Operations facility, Storage tanks, SCADA system, Plug 10 wells. The project site is located in Quay County, New Mexico, approximately 1 mile south of the town of Logan.

ARTICLE 2. PROJECT SUPERVISOR.

The Work will be supervised under the control and direction of the PROJECT SUPERVISOR, designated by the OWNER to be: Kent Satterwhite, P.O. Box 9, Sanford, TX, 79078, (Phone 806-865-3325), who is hereinafter called PROJECT SUPERVISOR and who is to act as OWNER's project representative, assume all duties and responsibilities and have the rights and authority assigned to the PROJECT SUPERVISOR in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION.

3.1. The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the PROJECT SUPERVISOR.

3.2. The Contract Time shall be measured from the date of commencement. The Work will be substantially completed not later than 270 calendar days from the date of commencement, or as follows:_____,
subject to adjustments of this Contract Time as provided in the Contract Documents.

3.3. Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Clause 8 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER liquidated damages in the amounts set forth in Clause 7 of the General Conditions for each day that expires after the time specified in paragraph 3.2 for Substantial Completion until the Work is substantially complete. .

ARTICLE 4. CONTRACT SUM.

4.1 The OWNER shall pay the CONTRACTOR the Contract Sum in current funds for the CONTRACTOR's performance of the Work in accordance with the Contract Documents. The Contract Sum shall be _____ Dollars ($_____), subject to additions and deductions as provided in the Contract Documents.

4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the OWNER:

4.3 Unit prices, if any, are as follows:

ARTICLE 5. PAYMENT PROCEDURES.

5.1 CONTRACTOR shall submit applications for payment in accordance with Clause 10 of the General Conditions. Applications for payment will be processed by PROJECT SUPERVISOR as provided in the General Conditions.

5.2. Progress Payments; Retainage. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by the PROJECT SUPERVISOR each month during performance of the Work as provided in Clause 10 of the General Conditions and elsewhere in the Contract Documents, less retainage in the amount of ten percent (10%) of the progress payment, unless Owner modifies the required retainage in its sole discretion as set forth in Clause 10 of the General Conditions.

5.3. The period covered by each application for payment shall be one calendar month ending on the last day of the month, or as follows:

5.4 Provided that an application for payment is received by the PROJECT SUPERVISOR not later than the 5th day of the month, the Owner shall make payment to the CONTRACTOR not later than the 30th day of the same month. If an application for payment is received by the

PROJECT SUPERVISOR after the application date fixed above, payment shall be made by the Owner not later than _30_ days after the PROJECT SUPERVISOR receives the application for payment.

5.5. Applications for payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the application for payment.

5.6. Final Payment. Upon final completion and acceptance of the Work in accordance with Clause 12 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by the PROJECT SUPERVISOR as provided in said Clause 12. The Owner's final payment to the CONTRACTOR shall be made no later than thirty days after the completion of the Work.

ARTICLE 6. CONTRACTOR'S REPRESENTATIONS.

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

6.1. CONTRACTOR has examined and carefully studied the Contract Documents, including the Addenda, and the other related data identified in the Bidding Documents including all specifications and technical data.

6.2. CONTRACTOR has conducted due diligence regarding the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.

6.3. CONTRACTOR is familiar with and is satisfied as to all federal, state and local laws and regulations that may affect cost, progress, performance and furnishing of the Work.

6.4 CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

6.5. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the site that relates to the Work as indicated in the Contract Documents.

6.6. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

6.7. CONTRACTOR has given PROJECT SUPERVISOR written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents and

the written resolution thereof by the PROJECT SUPERVISOR is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 7. TERMINATION OR SUSPENSION

7.1 The Contract may be terminated by the Owner or Work may be suspended as provided in Clauses 4, 5 and 6 of the General Conditions, and as provided elsewhere in the Contract Documents.

ARTICLE 8. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

8.1. This Agreement.

8.2. Exhibits to this Agreement.

8.3. Performance, Payment and other Bonds.

8.4. Notice to Proceed

8.5. General Conditions.

8.6. Supplementary Conditions.

8.7. General Requirements to Project.

8.8. Technical Specifications.

8.9. Project Drawings

8.10. Addenda numbers to inclusive.

8.11. CONTRACTOR's Bid.

8.12. Documentation submitted by CONTRACTOR prior to Notice of Award.

8.13. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All written Amendments and other documents amending, modifying or supplementing the Contract Documents.

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified or supplemented as by a written agreement of the parties.

ARTICLE 9. MISCELLANEOUS.

9.1. Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

9.2. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party without written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.3. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

9.4. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

9.5. OTHER PROVISIONS. NONE.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and the PROJECT SUPERVISOR. All portions of the Contract Documents have been signed, initialed or identified by OWNER and CONTRACTOR or identified by the PROJECT SUPERVISOR on their behalf.

This Agreement will be effective on _____, 20_____.

OWNER:	**CONTRACTOR**:
CANADIAN RIVER MUNICIPAL WATER AUTHORITY CORPORATION	**[NAME]**
By:_____	By:_____
Title:_____	Title:_____
(Corporate Seal)	(Corporate Seal)
Attest_____	Attest_____

SECTION 6

GENERAL CONDITIONS

TABLE OF CONTENTS
GENERAL CONDITIONS

CANADIAN RIVER MUNICIPAL WATER AUTHORITY CORPORATION
("CRMWA CORP.")
GENERAL CONDITIONS (REV. 6/99)
PROJECT: Salinity Control Facilities - Lake Meredith Salinity Control Project

GENERAL CONDITIONS

Clause 1. Definitions.

(a) "Contract" -- the Contract Documents form the Contract for the services to be provided by Contractor. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Project Supervisor and Contractor, (2) between CRMWA Corp. and any Subcontractor or (3) between any persons or entities other than CRMWA Corp. and Contractor. The Project Supervisor shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of Contractor's duties.

(b) "Contract Documents" -- The Contract Documents consist of the Agreement for Construction Contract between CRMWA Corp. and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to execution of the Contract, Contractor's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, other documents listed in the Agreement and Modifications issued after execution of the Contract.

(c) The term "Contract Time" means the time provided in the Contract Documents for completion of the Work.

(d) The term "Contracting Officer", as used in the Contract Documents, means a person authorized to bind CRMWA Corp. in matters relating to the Contract, including the General Manager, or such other person as may be authorized in writing by the Board of Directors of CRMWA Corp. to exercise the functions of a Contracting Officer for this Contract.

(e) The term "Drawings" means the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

(f) The term "Modification" is: (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Project Supervisor.

(g) The term "CRMWA Corp.", as used in the Contract Documents, mean the owner, Canadian River Municipal Water Authority Corporation.

(h) The term "Project" is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include services, materials, construction systems and/or labor by Contractor or by separate contractors. The Project shall consist of eight observation well to be drilled and completed in the vicinity of Logan, N.M.

(i) The term "Project Supervisor", as used in the Contract Documents, means the person or concern designated to perform the functions of the project supervisor for this Contract with regard to the Project Specifications contained in the Contract Documents. The Project Supervisor shall be designated either in the Supplementary General Conditions or in a separate writing signed by a Contracting Officer.

(j) "Specifications" -- The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.

(k) The term "Total Contract Price" means the amount identified in the Agreement, subject to adjustment as provided in the Contract Documents.

(l) The term "Unit Price Work" means work to be paid for on the basis of unit prices.

(m) The term "Work" means the construction services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

(n) Either a Contracting Officer or the Project Supervisor may delegate any part of his respective functions hereunder, but the Contractor will be notified in writing of any such delegation and the extent thereof.

(o) All formal communications from the Contractor to CRMWA Corp. in connection with the Contract shall be addressed to the attention of Mr. John Williams, General Manager, and shall reference the Contract by name, and shall be transmitted in duplicate to the CRMWA Corp. and the Project Supervisor.

Clause 2. <u>Changes</u>

(a) Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated herein and elsewhere in the Contract Documents.

(i) A Change Order shall be based upon agreement among CRMWA Corp., Contractor, and the Project Supervisor. A Construction Change Directive requires agreement by CRMWA Corp. and the Project Supervisor and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Project Supervisor alone.

(1) mutual acceptance of a lump sum properly itemized for both labor and materials and supported by sufficient substantiating data to permit evaluation;

(2) unit prices stated in the Contract Documents or subsequently agreed upon;

(3) cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

(4) as provided in subsection (c)(v) below.

(iii) Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Project Supervisor of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Total Contract Price or Contract Time.

(iv) A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Total Contract Price and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

(v) If the Contractor does not respond promptly or disagrees with the method for adjustment in the Total Contract Price, the method and the adjustment shall be determined by the Project Supervisor on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Total Contract Price, a reasonable allowance for overhead and profit. In such case, and also under subsection (c)(ii), the Contractor shall keep and present, in such form as the Project Supervisor may prescribe, an itemized accounting of costs attributable to the change together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this subsection shall be limited to the following:

(1) costs of labor, including, social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

(2) costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

(3) rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

(4) costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

(5) additional costs of supervision and field office personnel directly attributable to the change.

(vi) Pending final determination of cost to CRMWA Corp., amounts not in dispute may be included in any application by the Contractor for payment. The amount of credit to be allowed by the Contractor to CRMWA Corp. for a deletion or change which results in a net decrease in the Total Contract Price shall be based on actual net cost as confirmed by the Project Supervisor with a corresponding decrease in overhead and profit. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase or decrease, if any, with respect to that change.

(vii) If CRMWA Corp. and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Project Supervisor for determination.

(viii) When CRMWA Corp. and Contractor agree with the determination made by the Project Supervisor concerning the adjustments in the Total Contract Price and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution by the parties of an appropriate Change Order.

(d) The Project Supervisor will have authority to order minor changes in the Work not involving adjustment in the Total Contract Price or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Contractor. The Contractor shall carry out such written orders promptly.

Clause 3. **Differing Site Conditions.**

(a) The Contractor shall promptly, and before such conditions are disturbed, notify CRMWA Corp. in writing of:

(i) Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents, if any; or,

(ii) Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

(b) The Contracting Officer shall promptly investigate the conditions (or cause the Project Supervisor to do so), and if the Contracting Officer or Project Supervisor finds that such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, or performance of any part of the Work under this Contract, an equitable adjustment shall be made and the Contract shall be modified in writing accordingly.

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

Clause 4. Suspension of the Work.

(a) CRMWA Corp. may order the Contractor in writing to suspend, delay or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of CRMWA Corp..

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

(c) No claim under this clause shall be allowed (1) for any costs incurred more than twenty (20) days before Contractor shall have notified CRMWA Corp. and Project Supervisor in writing of the act or failure to act involved (but this requirement shall not apply to a claim resulting from a written suspension order), and (2) unless a claim in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay or interruption.

Clause 5. Termination for Convenience of CRMWA Corp.

(a) The performance of Work under this Contract may be terminated by CRMWA Corp. in whole, or from time to time in part, whenever CRMWA Corp. shall determine that such termination is in the best interest of CRMWA Corp.. Any such termination shall be effected by delivery to the Contractor of a written notice of termination specifying the extent to which performance of Work under the Contract is terminated and the date upon which such termination becomes effective.

(b) The Contractor shall incur no further obligations or costs or expenses of any kind in connection with the Work and the Contractor shall stop Work immediately when such termination becomes effective. The Contractor shall cooperate fully with CRMWA Corp. in minimizing the cost to CRMWA Corp. of such termination and shall, as directed by a Contracting Officer, protect the Work accomplished and properties acquired for performance of the Work, terminate or cancel incomplete subcontracts and purchase orders, and dispose of surplus materials and other properties. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders subject to the approval of CRMWA Corp.. CRMWA

Corp. may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to CRMWA Corp. or its designee.

(c) The Contractor shall transfer title and deliver to CRMWA Corp. such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has.

(d) The Contractor shall submit a termination claim to CRMWA Corp. and the Project Supervisor specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the Project Supervisor. If the Contractor fails to file a termination claim within one (1) year from the effective date of termination, CRMWA Corp. shall pay the Contractor an amount derived in accordance with subsection (f) below.

(e) CRMWA Corp. and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.

(f) Absent timely agreement to the amount due to the Contractor, CRMWA Corp. shall pay the Contractor the following amounts:

(i) Contract prices for labor, materials, equipment, and other services accepted under this Contract up to the effective date of termination specified in the Notice of Termination;

(ii) Reasonable costs incurred in preparing to perform and in performing the termination portion of the Work and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided, however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract had been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

(iii) Reasonable approved costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to subsection (b) of this Clause. These costs shall not include amounts paid in accordance with other provisions hereof.

(g) The total sum to be paid the Contractor under this Clause shall not exceed the Total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made.

Clause 6. **Termination for Contractor's Default.**

(a) If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will insure its completion within the time specified in this Contract or any extension hereof, CRMWA Corp. may, by written Notice of Termination to the Contractor, terminate the Contractor's right to proceed with the Work or such part of the Work

as to which there has been delay. In such event CRMWA Corp. may take over the Work and prosecute the same to completion, by contract or otherwise, and may take possession of and utilize in completing the Work such materials, appliances and plant as may be on the site of the Work and necessary therefor. Whether or not the Contractor's right to proceed with the Work is terminated, Contractor and its sureties shall remain liable for any damages to CRMWA Corp. resulting from Contractor's refusal or failure to complete the Work within the specified time.

(b) If CRMWA Corp. should so terminate the Contractor's right to proceed, the resulting damages recoverable by CRMWA Corp. will consist of such liquidated damages for delay as may be specified by the Clause 7 hereof until such reasonable time as reasonably may be required for final completion of the Work, together with any increased costs or such other damages occasioned CRMWA Corp. in so completing the Work.

(c) If, after notice of termination of the Contractor's right to proceed under the conditions of this Clause, it is determined for any reason that the Contractor was not in default under the conditions of this Clause, or that the delay was excusable under the conditions of Clause 8, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to Clause 5 concerning termination for the convenience of CRMWA Corp..

Clause 7. Liquidated Damages for Delay.

(a) Time is of the essence for this Contract, it being important that the Project be quickly and timely completed. Contractor and CRMWA Corp. acknowledge the difficulty of ascertaining actual damages for delay in performance, and therefore Contractor and CRMWA Corp. understand and agree that any failure, subject to Clause 8 herein, to complete any Work necessary to meet the completion date shall result in actual economic loss to CRMWA Corp. in an amount equal to or greater than $__750__per calendar day. Contractor shall pay to CRMWA Corp. $__750__for each calendar day that the Work, or any portion of the Work, remains incomplete after the completion date. Liquidated Damages are intended to compensate owner solely for administrative, overhead and other general damages caused by delays in performance by Contractor, excepting specific damages such as loss of state and/or federal funding opportunities and commitments or other damages to the extent specifically quantifiable; Contractor remains responsible for performing the Work as set out in the Project Specifications and other Contract documents.

(b) The Project Supervisor shall determine whether any Work necessary to meet the completion date remains incomplete and so notify Contractor and CRMWA Corp..

Clause 8. Extensions of Time.

(a) The Contractor's right to proceed shall not be terminated for default under Clause 6, nor the Contractor charged with liquidated damages for delay under Clause 7, if:

(i) The delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, acts of the public enemy, acts

of federal, state or local government in its sovereign capacity, acts of another contractor in the performance of a contract with CRMWA Corp., acts of CRMWA Corp., fires, floods, epidemics, quarantines, restrictions, strikes, freight embargoes, unusually severe weather, or delays of subcontractors or suppliers at any time arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or his subcontractors; and

(ii) The Contractor, within ten (10) days from the beginning of any such delay (unless CRMWA Corp. grants a further period of time), notifies CRMWA Corp. in writing of the causes of delay.

Clause 9. **Contractor Claims.**

(a) No claim by the Contractor for additional time or for additional compensation shall be allowed unless it be timely presented to the Project Supervisor in writing, together with appropriate detailed supporting documentation.

(b) The Project Supervisor will review the claim and take one of the following steps within ten (10) days of receipt of the claim:

(i) request additional supporting data from the claimant;

(ii) submit a schedule to the Contractor and the Contracting Officer indicating when the Project Supervisor expects to make a recommendation; or

(iii) recommend to the Contracting Officer rejection or approval of the claim, in whole or part, stating reasons for the recommendation.

(c) Upon obtaining the Project Supervisor's recommendation, the Contracting Officer shall approve or reject the claim, in whole or in part. If the Contracting Officer approves the claim, the Project Supervisor shall take appropriate steps to implement the claim. Should the Contracting Officer reject a claim, the Contractor may within twenty (20) days:

(i) submit additional data supporting the claim to the Project Supervisor;

(ii) modify the initial claim; or,
(iii) notify the Project Supervisor that the claim stands.

(d) Following rejection of an initial or modified claim, the Project Supervisor shall notify the Contracting Officer of any change in its recommendation within ten (10) days of the Contractor's submission of additional data, modification of the initial claim, or notification that the claim stands.

(e) If the Contracting Officer fails to make a decision within fifty (50) days from the receipt of any recommendation from the Project Supervisor, the claim shall be deemed rejected.

(f) No suit shall be brought by Contractor upon this Contract or for breach of this Contract more than two years after the Contracting Officer's final decision under this Clause. No suit shall be brought by the Contractor upon this Contract or for breach of this Contract if:

(i) the Contracting Officer rejected the Contractor's initial claim; and,

(ii) the Contractor failed to take one of the steps outlined in subsection (c) above.

Clause 10. Progress Payments.

(a) Promptly following execution of the Contract by CRMWA Corp. and the Contractor, the Contractor shall submit to the Project Supervisor for approval a breakdown of the Total Contract Price, itemizing material and labor for the various classifications of the Work, and an approximate monthly draw schedule. The breakdown will be used as a basis for the progress payments on the Contract.

(b) Upon application of Contractor, accompanied by written invoices, if requested, CRMWA Corp. shall make monthly payments as the Work progresses, based upon percentage of the completion of the Work as determined from estimates submitted by Contractor, certified by the Project Supervisor, and approved by a Contracting Officer. The progress payment shall be computed based on the Total Contract Price multiplied by the percentage of completion of the Work, less the aggregate of all payments previously made. CRMWA Corp. shall retain from each progress payment a retainage in the amount of **ten percent (10%)** of the progress payment computed as above. There after, if the Contracting Officer determines that the Contractor's progress is satisfactory, remaining progress payments may be paid in full. CRMWA Corp. shall not required to pay interest on the 10 percent retainage held on the first 50 percent of work completed. If CRMWA Corp holds any retainage on the remaining 50 percent of the work completed, CRMWA Corp. shall pay interest on such retainage from the date the retainage is withheld to the date of payment to the Contractor. The interest rate to be paid on such retainage shall be the rate of interest paid by CRMWA Corp.'s depository bank on interest bearing accounts of similar amounts during the period of time interest accrues as provided herein. In preparing estimates, the material delivered and preparatory work done shall be taken into consideration; however, the Contractor shall not include in any application for monthly payments the costs of equipment or material to be installed on the Work site unless that equipment or material is either installed or delivered to a bonded warehouse by the time of Contractor's application.

(c) CRMWA Corp. may withhold from progress payments to such extent as may be necessary to protect CRMWA Corp. from loss on account of defective work not remedied, claims by others against the Contractor, or Contractor's failure to maintain scheduled progress. When the ground for withholding shall be removed, payments will be made to the Contractor for the sums withheld. A progress payment shall not constitute acceptance of Work not in accordance with the Contract Documents.

(d) All material and work covered by partial payments made shall thereupon become sole property of CRMWA Corp., but this provision shall not be construed as relieving Contractor from the sole responsibility for the care and protection of materials and work upon which payments shall have been made, or the restoration of any damaged work or as a waiver of the right of CRMWA Corp. to require strict fulfillment of all of the terms of the Contract. Payments to the Contractor shall not be construed to release the Contractor or his sureties from any obligation under this Contract.

(e) The Contractor shall promptly pay each subcontractor upon receipt of payment from CRMWA Corp., out of the amount paid to the Contractor on account of such subcontractor's portion of the Work, the amount to which said subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such subcontractor's portion of the Work.

(f) Neither CRMWA Corp. nor the Project Supervisor shall have an obligation to pay or to see to the payment of money to a subcontractor except as may otherwise be required by law.

Clause 11. <u>Substantial Completion</u>

(a) Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so CRMWA Corp. can utilize the Work for its intended use, or so that other contractors may commence additional Work in accordance with the work sequence formulated by the Project Supervisor.

(b) When the Contractor considers that the Work, or a portion thereof which CRMWA Corp. agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Project Supervisor a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Project Supervisor will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Project Supervisor's inspection discloses any item, whether or not included on the Contractor's list, which is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Project Supervisor. The Contractor shall then submit a request for another inspection by the Project Supervisor to determine Substantial Completion. When the Work or designated portion thereof is substantially complete, the Project Supervisor will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of CRMWA Corp. and shall fix the time within which the Contractor shall finish all items on the list CRMWA accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to CRMWA Corp. and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

(c) Contractor shall be responsible for obtaining, in conjunction with obtaining a Certificate of Substantial Completion, any certificate from any appropriate governmental authority necessary for CRMWA Corp. to use the Work or any designated portion thereof. Upon delivery to Contractor of the Certificate of Substantial Completion together with a written acknowledgment that CRMWA Corp. thereby assumes responsibility for maintenance and for risk of loss, CRMWA Corp. may take beneficial occupancy of the Work or a designated portion thereof.

Clause 12. Final Acceptance and Payment.

(a) Following issuance of a Certificate of Substantial Completion, and/or upon completion of the Work in full and strict conformity to the Contract Documents and its final acceptance by Contracting Officer and Project Supervisor, CRMWA Corp. shall pay the unpaid balance of the Total Contract Price less any sum that may be necessary to settle any claim CRMWA Corp. may have against Contractor or that may be necessary to settle any outstanding obligations of Contractor or of his subcontractors arising out of or incident to the performance of the Contract.

(b) Prior to final payment and as a condition thereto, Contractor shall furnish CRMWA Corp. with an affidavit that all bills and claims for labor, materials, equipment and other indebtedness connected with the Work for which CRMWA Corp. or CRMWA Corp.'s property might be responsible or encumbered; shall have been satisfied, except as stated therein. Contractor shall also furnish a release of all claims against CRMWA Corp. and Project Supervisor, arising under and by virtue of the Contract, other than such claims as may be specifically excepted by Contractor from the operation of the release in stated amounts to be set forth therein. If any subcontractor refuses to furnish a release or waiver required by CRMWA Corp., the Contractor may furnish a bond satisfactory to CRMWA Corp. to indemnify CRMWA Corp. against such lien. If such lien remains unsatisfied after payments are made, Contractor shall refund to CRMWA Corp. all money that CRMWA Corp. may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees. Acceptance of final payment by Contractor, a subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

Clause 13. Specifications and Drawings.

(a) As between the Contractor and CRMWA Corp., the Specifications and the accompanying Drawings, if any, are the property of CRMWA Corp. and shall be returned to CRMWA Corp. at the completion of the Contract and before the Work will be accepted.

(b) The Contractor shall keep at the site copies of the Drawings and Specifications, and the Project Supervisor and any Contracting Officer shall at all times have access thereto. Anything mentioned in the Specifications and not shown in the Drawings, or shown in the Drawings and not mentioned in the Specifications, shall be of like effect as if shown and mentioned in both. In case of differences between the Drawings and the Specifications, the

Specifications shall govern. Omissions from the Drawings or Specifications, or the misdescription of details of Work which are evidently necessary to carry out the intent of the Drawings and Specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the Work, but they shall be performed as if fully and correctly set forth and described in the Drawings and Specifications.

(c) The Contractor shall check all Drawings furnished him immediately upon their receipt and shall promptly notify the Project Supervisor of any discrepancies. Figures marked on Drawings shall, in general, be followed in preference to scale measurements. Large-scale Drawings shall, in general, govern over small-scale Drawings. The Contractor shall compare all Drawings and verify the figures before laying out the Work and will be responsible for any errors that might have been avoided thereby. When measurements are affected by conditions already established, the Contractor shall take measurements notwithstanding the giving of scale or figure dimensions in the Drawings. In case of discrepancy, either in the figures, in the Drawings or in the Specifications, the matter shall be promptly submitted to the Project Supervisor, who shall promptly make a determination in writing with the approval of a Contracting Officer. Any adjustment by the Contractor without such a determination shall be at the Contractor's own risk and expense.

(d) References to Drawings and/or Specifications, in this clause and throughout the Contract Documents, are references to the same as modified by all applicable addenda and changes.

Clause 14. <u>Shop Drawings and Samples.</u>

(a) Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data that are prepared by the Contractor or any subcontractor, manufacturer, supplier, or distributor, and that illustrate some portion of the Work.

(b) Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to assist in the establishment of standards by which the Work will be judged.

(c) The Contractor shall review and designate (stamp) its approval and submit, with reasonable promptness and in orderly sequence, all shop drawings and samples required by the Contract Documents, or subsequently required by the Project Supervisor as covered by a Change.

(d) Shop drawings and samples shall be properly identified, as specified, or as the Project Supervisor may require. At the time of submission, the Contractor shall inform the Project Supervisor in writing of any deviation in the shop drawings or samples from the requirements of the Contract Documents.

(e) By approving and submitting shop drawings and samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that it has checked and coordinated

each shop drawing and sample with the requirements of the Work and of the Contract Documents.

(f) The Project Supervisor will review and approve the shop drawings and samples with reasonable promptness, but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The approval of the Project Supervisor of a separate item shall not indicate approval of an assembly in which the item functions. The approval of the Project Supervisor of the shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Project Supervisor in writing of such deviation at the time of submission and the Project Supervisor has given written approval to the specific deviation, nor shall the approval of the Project Supervisor relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples.

(g) The Contractor shall make any corrections required by the Project Supervisor and shall resubmit the required number of corrected copies of the shop drawings or new samples of materials until approved. The Contractor shall direct specific attention in writing to any new revisions other than the corrections requested by the Project Supervisor on previous submissions.

(h) No work requiring a shop drawing or sample submission shall be commenced until the submission has been approved by the Project Supervisor. All such work shall be in accordance with approved shop drawings and samples.

Clause 15. <u>As-Built Drawings.</u>

(a) During the performance of Work under this Contract, the Contractor shall report to the Project Supervisor all changes in such Work that constitute significant departures from the original Drawings. The Project Supervisor shall prepare, based on Contractor's reports, a set of Drawings thus corrected and changed that shall show the Work as actually constructed ("As-Built Drawings"). Such As-Built Drawings shall be delivered to CRMWA Corp. at the earliest practicable date prior to completion of all work under the Contract, in any event not later than the date of acceptance of the completed Work.

(b) The Contractor shall review said As-Built Drawings on the Work site with the Project Supervisor at weekly intervals to verify proper recording of data and shall include such revised Drawings as may be furnished by the Project Supervisor as the job progresses.

(c) Contractor's reports of changes to the Work shall include, and the As-Built Drawings shall show, sufficient detail to convey the following information:

(i) physical dimensions; relation to existing conditions, and horizontal and vertical location of all underground or hidden installations.

(ii) equipment operation and maintenance information; Contractor shall submit manufacturer's literature, including schematic diagrams, control diagrams, maintenance charts, parts lists, etc., where applicable.

Clause 16. Material and Workmanship.

(a) Unless otherwise specifically provided in this Contract, all equipment, material, and articles incorporated in the Work covered by this Contract are to be new and of the most suitable grade for the purpose intended. The Contractor shall furnish to the Project Supervisor for its approval the name of the manufacturer, the model number, and other identifying data and information respecting the performance, capacity, nature, and rating of the machinery and mechanical and other equipment that the Contractor contemplates incorporating into the Work. When required by this Contract, or when called for by the Project Supervisor, the Contractor shall furnish to the Project Supervisor for approval full information concerning the material or articles the Contractor contemplates incorporating into the Work. When so directed, samples shall be submitted for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles installed or used without required approval shall be at the risk of subsequent rejection.

(b) All Work under this Contract shall be performed in a skillful and workmanlike manner. The Project Supervisor may, in writing, require the Contractor to remove from the Work any employee the Project Supervisor deems incompetent, careless, or otherwise objectionable.

(c) Neither custom nor usage of trade shall require CRMWA Corp. to accept materials or workmanship not in strict and complete compliance with the Contract Documents.

Clause 17. Inspection and Tests.

(a) Except as otherwise provided in this Contract, inspection and testing by CRMWA Corp. of material and workmanship required by this Contract shall be made at reasonable times and at the site of the Work, unless the Project Supervisor determines that such inspection or test of material that is to be incorporated in the Work shall be made at the place of production, manufacture, or shipment of such material. To the extent specified by the Project Supervisor at the time of determining to make an off-site inspection or test, such inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance, nor in any way affect the continuing rights of CRMWA Corp. after acceptance of the completed Work under the terms of subsection (g) of this Clause, except as herein above provided.

(b) All tests, inspections and approvals of portions of the Work required by laws or regulations of public authorities having jurisdiction shall be made at an appropriate time. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Project Supervisor.

(c) The Contractor shall, without charge, replace any material or correct any workmanship found by CRMWA Corp. not to conform to the Contract requirements, unless in the public interest CRMWA Corp. consents to accept such material or workmanship with an appropriate adjustment in Total Contract Price. Contractor shall without charge, replace any material or correct any workmanship found by public authorities having jurisdiction not to conform with laws, ordinances or regulations concerning such materials or workmanship. The

Contractor shall promptly segregate and remove rejected material from the premises. The Contractor will be charged with the additional cost of any test or inspection of the replaced material or corrected workmanship.

(d) If the Contractor does not promptly replace rejected material or correct rejected workmanship, CRMWA Corp. (1) may, by contract or otherwise, replace such material or correct such workmanship and charge the cost thereof to the Contractor, or (2) may terminate the Contractor's right to proceed in accordance with Clause 6 of these General Conditions.

(e) The Contractor shall furnish promptly, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Project Supervisor. All inspections and testing by CRMWA Corp. shall be performed in such manner as not unnecessarily to delay the Work. Special, full-size, and performance tests shall be performed as described in this Contract. The Contractor shall be charged with any additional cost of inspection when material and workmanship are not ready at the time specified by the Contractor for its inspection.

(f) Should it be considered necessary or advisable by the Project Supervisor or CRMWA Corp. at any time before acceptance of the entire Work to make an examination of Work already completed, by removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and material. If such work shall have been covered without the approval of the Project Supervisor, or if such Work is found to be defective or nonconforming to the Project Specifications or other Contract Documents in any material respect, Contractor shall bear all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, an equitable adjustment (not including overhead and profit) shall be made in the Total Contract Price to compensate the Contractor for the additional services involved in such examination and reconstruction and, if completion of the entire Work has been delayed thereby, he shall, in addition, be granted a suitable extension of time in writing.

(g) Unless otherwise provided in this Contract, acceptance by CRMWA Corp. shall be made as promptly as practicable after completion and inspection of all Work required by this Contract. Acceptance shall be final and conclusive except as regards hidden or latent defects, fraud, or such gross mistakes as may amount to fraud, deceptive acts or practices, or as regards CRMWA Corp.'s rights under any warranty or guarantee.

Clause 18. <u>Subcontractors and Materialmen.</u>

(a) A Subcontractor is a person or entity who contracts with the Contractor to perform any of the Work at the site. A Materialman is a person who contracts with the Contractor to supply any material or equipment for installation or incorporation in the Work, including any item especially designed or fabricated.

(b) At the time of award of the Contract, and only as may be permitted in the Bid Documents, the Contractor shall have submitted to CRMWA Corp. for approval his list of preferred Subcontractors and Materialmen within the time specified by CRMWA Corp..

CRMWA Corp. shall approve or disapprove the Subcontractors and Materialmen at the time of award. The Contractor shall award no subcontract or purchase order until a Contracting Officer shall have approved the particular Subcontractor or Materialman for the particular portion of the Work or material supply to be sublet to him. Such approval will not unreasonably be withheld, but a prior occasion in which the performance of a particular Subcontractor or Materialman was deemed by CRMWA Corp. to be unsatisfactory will be a reason for withholding approval. The Contractor shall not contract with a proposed Subcontractor or Materialmen to whom the Contracting Officer has made a reasonable and timely objection.

(c) The Contractor shall bind each Subcontractor by written Subcontract to all the obligations of the Contract Documents in respect of the sublet Work that are favorable to the CRMWA Corp. The Contractor shall not change a Subcontractor previously selected if the Contracting Officer makes a reasonable objection to such change.

(d) The Contractor will hold harmless and indemnify CRMWA Corp., the Architect/ Engineer and their officers and employees and agents from all liability, loss or expense (including attorney's fees) on claims by Subcontractors or Materialmen and based on alleged defaults by Contractor.

(e) Nothing contained in the Contract Documents shall create any contractual relationship between CRMWA Corp. and any Subcontractor or Materialman.

Clause 19. <u>Other Contracts.</u>

(a) CRMWA Corp. reserves the right to award other contracts for additional Work related to the Project, and the Contractor shall cooperate fully with such other contractors and CRMWA Corp. representatives and carefully fit Contractor's own Work to such additional Work as directed by the Project Supervisor. If any part of this Contractor's Work depends for proper execution or proper results on Work of any other contractor or CRMWA Corp. representative, the Contractor shall inspect and promptly report to the Project Supervisor any discrepancies or defects it may find in such additional Work that render it unsuitable for such proper execution and results. Failure of a Contractor so to inspect and report shall constitute an acceptance of the additional Work as fit and proper, except as to defects that may develop in the additional Work after the execution of this Contractor's Work. If the Contractor claims that delay or additional cost is involved because of other contracts for additional Work to the Project, the Contractor shall promptly make such claim in accordance with Clause 9 herein to the Contracting Officer and Project Supervisor who shall review such claim to determine if an adjustment to the Contract Price is warranted.

(b) Contractor shall hold harmless and indemnify CRMWA Corp., the Project Supervisor and their officers and employees and agents from all liability, loss or expenses (including attorneys' fees) on any claim arising from alleged interference with or damage to the Work and property of other contractors by the Contractor.

(c) Contractor shall afford separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and

shall correct and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

Clause 20. Superintendent.

The Contractor shall have a competent superintendent, satisfactory to and approved by the Project Supervisor and CRMWA Corp., on the Work at all times during progress, with authority to act for him. All communications given to the superintendent will be deemed to have been given to the Contractor. An approved superintendent will not be removed from the Work by the Contractor without the approval of the Project Supervisor unless that superintendent leaves the employ of the Contractor.

Clause 21. Permits and Responsibilities.

(a) Unless provided otherwise in the Contract Documents including the Supplementary Conditions, the Contractor shall, without additional expense to CRMWA Corp., be responsible for obtaining all necessary licenses and permits, and for complying with any applicable Federal, State and municipal laws, codes and regulations, in connection with the prosecution of the Work. Should the Contractor observe that any provisions in or Specifications or Drawings for the Contract Documents are at variance with the requirements imposed on a non-profit corporation such as CRMWA Corp., the Contractor shall notify the Project Supervisor and CRMWA Corp. and any necessary changes shall be adjusted by a Change Order pursuant to Clause 2.

(b) The Contractor shall take proper safety and health precautions in connection with the performance of the Contract to protect the Work, the workers, the public, and the property of others. Contractor shall assume full responsibility for compliance with the Occupational Safety and Health Administration regulations pertaining to safety systems. If necessary, Contractor will be responsible for completion of additional detailed plans and specifications for safety to the extent that such detailed plans and specifications are necessary to supplement the provisions of these General Conditions.

(c) All parts of the Contract shall be performed in strict accordance with CRMWA Corp.'s safety requirements, and applicable federal (OSHA and any other), state, and local requirements. Contractor is fully obligated for the safety of all Work site personnel, including Contractor's employees and agents as well as subcontractors and their employees and agents, suppliers, vendors, and visitors.

(i) Contractor shall ensure that all of its employees, agents, and subcontractors (including employees and agents of subcontractors) are equipped with required personal protection equipment; i.e., appropriate footwear, eye protection, hard hats, respiratory protection, safety belts and harnesses, and any other health and safety-related equipment as may be required for or appropriate to Work site conditions. Such equipment shall be furnished by the Contractor at the Contractor's expense.

(ii) Contractor shall maintain a file of Material Safety Data Sheets (MSDS) for all chemicals used, or brought onto the Work site by the Contractor and all subcontractors. Hard copies of MSDSs shall be available at the physical location of the Work site. Contractor and Subcontractors shall be familiar with and shall comply with the requirements of the OSHA Hazard Communication standard (29 C.F.R. Section 1910.1200) and any similar laws, rules or regulations adopted by the State of New Mexico, including the applicable provisions of the New Mexico Occupational Health and Safety Act [50-9-1 to 50-9-25 NMSA 1978].

(iii) Contractor shall be responsible for safety on the Work site. Contractor is responsible for continuously monitoring safety conditions on the Work site to determine if it is safe and suitable for performance of the Work. If Contractor believes that an unsafe condition exists that directly or indirectly affects the Contractor's or any subcontractor's performance of the Work, Contractor shall either: (1) correct the unsafe condition prior to performing the Work, or (2) ensure that the party responsible for the condition corrects such condition before performing the Work. Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection of the public, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

(v) Any questions regarding safety conditions or the safety requirements of this Contract shall be directed to the Project Supervisor at (806) 865-3325.

Clause 22. Deliveries.

The Contractor shall be responsible for all materials and equipment delivered, whether or not installed, and Work performed until completion and acceptance of the entire construction Work, except for any completed unit of construction that which theretofore may have been accepted.

Clause 23. Conditions Affecting the Work.

The Contractor shall be responsible for having taken steps reasonably necessary to ascertain the nature and location of the Work, and the general and local conditions that can affect the Work or the cost thereof. Any failure by the Contractor to do so will not relieve it from responsibility for successfully performing the Work without additional expense to CRMWA Corp.. CRMWA Corp. assumes no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of this Contract, unless such understanding or representations by CRMWA Corp. are expressly stated in the Contract Documents.

Clause 24. Patent Indemnity.

Except as otherwise provided, the Contractor agrees to indemnify CRMWA Corp., the Project Supervisor and their officers, agents and employees against all liability, loss and expense (including attorney's fees) for alleged infringement upon any Letters Patent of the United States arising out of the performance of this Contract, or out of the use or disposal by or for the account of CRMWA Corp. of supplies furnished or construction work performed hereunder.

Clause 25. Progress Schedule.

The Progress Schedule shall be as specified by the Project Supervisor in the Project Specifications contained in the Contract Documents.

Clause 26. Bonds.

Prior to commencement of Work hereunder, Contractor will provide a Performance Bond if the contract price exceeds One Hundred Thousand Dollars ($100,000). In addition, for those contracts wherein the bid documents expressly allow the Contractor to utilize subcontractors, the contractor shall provide Payment Bond for contracts in excess of Twenty-Five Thousand Dollars ($25,000). Each bond shall be in principal amount equal to 100% of the Total Contract Price, conditioned that Contractor will faithfully perform all its undertakings in this Contract and will fully pay all persons furnishing labor and material in the prosecution of the Work provided for in this Contract. Such Performance Bond and Payment Bond shall be on forms supplied or approved by CRMWA Corp., with good and sufficient surety from a Bonding Company that is licensed to do business in New Mexico and that is approved by a Contracting Officer. If any surety upon any bond becomes insolvent or otherwise ceases to do business in New Mexico, the Contractor shall immediately furnish equivalent security to protect the interests of CRMWA Corp. and of persons furnishing labor and materials in the prosecution of the Work. **Note that in most instances the Contract Documents expressly prohibit the use of subcontractors. Subcontractors may be used on the Work only when expressly allowed by the Contract Documents.**

Clause 27. Indemnity and Insurance.

(a) **Indemnity.** TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL INDEMNIFY AND SAVE HARMLESS CRMWA CORP. AND ITS DIRECTORS, OFFICERS AND EMPLOYEES FROM AND AGAINST ALL CLAIMS, SUITS (INCLUDING COUNSEL FEES AND OTHER EXPENSES OF SUIT), WHETHER GROUNDLESS OR NOT, JUDGMENTS AND AWARDS, OR ON ACCOUNT OF ANY DAMAGE TO PROPERTY OR INJURY (INCLUDING DEATH) TO PERSON (INCLUDING ANY DAMAGE OR INJURY TO PROPERTY OR PERSON OR ANY EMPLOYEE OF CONTRACTOR, ITS SUBCONTRACTORS, CRMWA CORP., THE PROJECT SUPERVISOR) THAT MAY OCCUR OR BE ALLEGED TO HAVE OCCURRED IN CONNECTION WITH THE PERFORMANCE OF THIS CONTRACT, INCLUDING DAMAGE OR INJURY CAUSED OR ALLEGED TO HAVE BEEN CAUSED IN PART BY THE NEGLIGENCE OF ONE OR MORE PARTIES INDEMNIFIED HEREUNDER.

CONTRACTOR ASSUMES ALL RISK OF DAMAGE OR INJURY (INCLUDING DEATH) TO CONTRACTOR'S OWN PROPERTY OR PERSON OR TO THE PROPERTY OR PERSON OF CONTRACTOR'S EMPLOYEES FROM ANY CAUSE WHATSOEVER.

(b) **Insurance.** Contractor shall carry insurance at Contractor's expense throughout the term of this contract to cover the claims and in the amounts set forth in Exhibit A, Section 9.

(i) New Mexico Standard Workers' Compensation and Employers' Liability in amount sufficient for the laws of New Mexico. The Contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of the applicable statutes of New Mexico for all employees of the Contractor providing services on the Project, for the duration of the Project.

(ii). Certificate. The Contractor must provide a certificate of insurance to CRMWA Corp. prior to being awarded the Contract.

(iii) By signing this Contract or providing or causing to be provided a certificate of coverage, the Contractor is representing to CRMWA Corp. that all employees of the Contractor who will provide services on the Project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or regulatory authorities. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

(iv) The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor that entitles CRMWA Corp. to declare the Contract void if the Contractor does not remedy the breach within ten days after receipt of notice of breach from CRMWA Corp..

(v) Commercial General Liability - See Exhibit A. The policy shall not contain any exclusion deleting any coverage in the basic policy form including but not limited to Products and Completed Operations, Contractual, Personal and Advertising Injury, or Explosion, Collapse and Underground Property Damage Hazard. The policy shall include the following endorsements:

(a) an endorsement adding CRMWA Corp. as an additional insured using the following wording: "'WHO IS AN INSURED' (Section II) is amended to include CRMWA Corp., its officers, employees and elected officials as insureds, but only with respect to liability arising out of 'your work' for that insured by or for you. This insurance is primary and any other valid and collectible insurance available to the additional insureds in this endorsement shall be excess";

(b) an endorsement providing that the general aggregate limit applies separately to the Work performed under this Contract; and,

(c) An endorsement providing CRMWA Corp. with at least thirty (30) days' advance notice of cancellation or nonrenewal.

(vi) Business Auto Liability with a Combined Single Limit as shown in Exhibit A. The policy shall be endorsed to provide CRMWA Corp. with at least thirty (30) days' advance notice of cancellation or nonrenewal.

(vii) Builders' Risk insurance with a limit for the amount equal to 100% of the Total Contract Price. The policy shall insure on an all risk basis; shall cover the interest of CRMWA Corp., Contractor and all subcontractors as their interest may appear and waive subrogation rights against any of these; shall include as covered property all fixtures, materials supplies, machinery and equipment to be used in, or incidental to the construction; shall include provisions that any exclusions relating to faulty workmanship or design error do not apply to ensuing damage from a covered cause of loss; shall include provisions covering loss of tuition and fees; shall not include any exclusions of coverage during testing of equipment; shall be specific as to coverage and shall not be considered as contributing insurance with any permanent insurance maintained on the present premises.

(viii) All insurance required in paragraph (b) will be evidenced by the following, which shall be delivered to CRMWA Corp.'s designated insurance representative no later than 7 days prior to the commencement of the Work:

(a) Certificates of insurance which identify the insurance company, effective and expiration dates and limits of insurance, and statements to the effect that the insurance shall not be canceled, reduced, restricted, limited or allowed to expire until at least thirty (30) days after CRMWA Corp. and Contractor shall have received written notice by certified mail, as evidenced by return receipt;

(b) For each policy except Contractor's Builders Risk, a copy of the declarations page; and, if not on the declarations page, any schedule showing the limits of insurance, and a list of all endorsements attached to the policy; and a copy of each special endorsement requested in (b); and,

(c) For Contractor's Builder's Risk, a complete copy of the policy including insuring agreement, coverages, exclusions, conditions and any endorsement applicable to this Work.

(ix) CRMWA Corp. reserves the right to modify these insurance requirements if it feels that such a modification would be in its best interest. A request for such modification should be submitted in writing by Contractor or Contractor's authorized agent.

Clause 28. <u>Prevailing Wage Rates.</u>

(a) Among the Contract Documents is a schedule headed "Hourly Wage Rates," wherein is set forth, among the other data, an hourly "Base Wage" for each of various

classifications of construction workmen and mechanics. This schedule shall apply to all wages under this Contract and changes thereto. Contractor shall post the schedule in a prominent and easily accessible place at the site of the Work. The prevailing wages set out in the schedule shall remain effective during the entire term of this Contract. As required by the Texas Government Code, Chapter 2258, the Contracting Officer for CRMWA Corp. has ascertained and does specify that the general prevailing rate of per diem wages (for eight hours of work during regular working hours on a day not a Saturday or Sunday or holiday), in the locality in which the Work is to be performed, is so listed for each respective craft or type of workman or mechanic needed to execute the Contract; and also that the prevailing rate for legal holiday and overtime work is as further shown in said schedule. The Contractor shall forfeit as a penalty to CRMWA Corp. sixty dollars ($60.00) for each laborer, workman or mechanic employed for each calendar day, or portion thereof, that such laborer, workman or mechanic is paid less than said stipulated rate for any work done under this Contract by the Contractor or by any subcontractor under the Contractor. CRMWA Corp. may withhold additional funds as appropriate when confronted with wage rate violations.

(b) CRMWA Corp. has the right to review, and may request copies of random samples of, Contractor's and any subcontractor's payrolls without warning. CRMWA Corp. may conduct random employee interviews across various trades, on or off of the Work site, with no warning.

Clause 29. Bankruptcy.

Prior to final acceptance of the Work, the Contractor shall not suffer himself to be adjudicated as bankrupt nor file any petition for relief under any chapter of the Bankruptcy Act. Any bankruptcy filing by the Contractor during the term of this Contract shall constitute grounds for termination of this Contract by CRMWA Corp. at its sole option.

Clause 30. Warranty.

In addition to the warranties provided for elsewhere, the Contractor shall warrant the Work against defective workmanship or defective materials for one year from the date of final acceptance by CRMWA Corp. Contractor warrants that, throughout that one-year period, all movable or adjustable components and equipment shall remain in first-class working order. Promptly after receipt of notice, the Contractor shall correct at its own expense all defects discovered during this one year period. Prior to final acceptance of the Work, the Contractor shall obtain, assign and deliver to CRMWA Corp. through the Project Supervisor all warranties furnished by materialmen and subcontractors and their suppliers and manufacturers and fabricators.

Clause 31. Taxes.

Except as otherwise provided in the Contract Documents, the Total Contract Price includes all applicable federal, state and local taxes, including any applicable gross receipts taxes imposed by a taxing authority. The purchase, lease, rental, storage, use or other consumption of tangible personal property for the performance of this Contract by the Contractor is exempted

from state and local sales tax pursuant to the Texas Limited Sales Excise and Use Tax Act (see Section 151.311 of the Texas Tax Code). To claim the benefit of this exemption, the Contractor must comply with such procedures as may be prescribed by the State Comptroller of Public Accounts.

Clause 32. Third Parties.

All conditions of this Contract shall be binding upon and inure to the benefit of the successors and assigns of CRMWA Corp. and of Contractor, but Contractor shall not assign or subcontract this Contract in whole or part, nor assign any monies due or to become due hereunder, without in each case the prior written consent of CRMWA Corp.. No provision of this Contract shall inure to the benefit of any third party who is neither an assign nor a successor of CRMWA Corp. or of the Contractor.

Clause 33. Nonwaiver of Default.

Any failure by CRMWA Corp. at any time or from time to time to enforce or require the strict keeping and performance of any of the terms or conditions of this Contract shall not constitute a waiver of any such term or condition nor effect nor impair such term or condition in any way or the right of CRMWA Corp. at any time to avail itself of such remedies as it may have for any breach or breaches of any such term or condition.

Clause 34. Severability.

If any provision of this Contract shall be determined to be invalid or unenforceable, this Contract shall be reformed to the extent necessary to make the offending provision valid and enforceable, or if this offending provision cannot be modified so as to be valid and enforceable, this Contract shall be reformed so as to exclude the offending provision from this Contract; as so reformed, the Contract shall be binding upon and enforceable by both CRMWA Corp. and the Contractor. No additional consideration shall be due to either party by reason of any such reformation.

Clause 35. Status Reports.

A representative of Contractor shall be available to provide a report on the status of the Contract and Work thereunder to the Project Supervisor. Such representative shall be available as may be requested during the progress of the Work.

Clause 36. Commencement of the Work.

Contractor shall commence the Work on the Construction Start Date designated by CRMWA Corp.. Prior to commencement, Contractor shall be responsible for signing and returning the Agreement For Construction Contract, furnishing Payment and Performance Bonds with proper form and content, and providing Certificates of all required insurance. Failure to commence the Work on the Construction Start Date shall not extend the time for completion of the Work.

Clause 37. Cleaning Up.

The Contractor shall keep the Work site and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. If the Contractor fails to clean up as provided in the Contract Documents, CRMWA Corp. may do so and the cost thereof shall be charged to the Contractor.

Clause 38. Access to Work.

The Contractor shall provide authorized representatives of CRMWA Corp. and the Project Supervisor access to the Work in preparation and progress wherever located.

Clause 39. Equal Employment Opportunity.

During the performance of the Work, Contractor agrees as follows:

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

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

(c) Contractor will sent to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the Contractors commitments under Section 202 of executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) Contractor will comply with all provision of Executive Order N. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

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

(f) In the event of Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246, of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) Contractor will included the provisions of paragraphs (a) though (g) above in every subcontract (to the extent subcontracts are allowed by CRMWA Corp. in connection with the Work) or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

SECTION 7

SUPPLEMENTARY GENERAL CONDITIONS

CANADIAN RIVER MUNICIPAL WATER AUTHORITY CORPORATION
("CRMWA CORP.")
SUPPLEMENTARY CONDITIONS (REV. 6/99)
PROJECT: Salinity Control Facilities

SUPPLEMENTARY GENERAL CONDITIONS

These Supplementary General Conditions and the Specifications found herein amend or supplement the General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

SC-1. DEFINITIONS (Clause 1 of General Conditions supplemented)

1.1 "Addenda"-- Addenda issued by the Project Supervisor during time of bidding to clarify bid specifications. Addenda are incorporated by reference into the Contract Documents.

1.2 "Owner" --Whenever the term "OWNER" is used in the Contract Documents, it shall be understood as referring to Canadian River Municipal Water Authority Corporation, also referred to in the Contract Documents as "CRMWA Corp."

1.3 "Project Supervisor"-- Whenever the Term "Project Supervisor" is used in the contract Documents, it shall be understood as referring to: Kent Satterwhite, P.O. Box 9, Sanford, TX, 79078, (Phone 806-865-3325).

SC-14. SUBSURFACE AND PHYSICAL CONDITIONS (Clause 14 of General Conditions supplemented)

14.1 The following reports of exploration and tests of subsurface conditions at the site of the work:

a. **Geologic Logs of observation wells, drill holes, test wells, etc.**

b. _____

c. _____

The foregoing reports upon which Contractor may rely are available for inspection and duplication at the office of the Project Supervisor.

SC.16 Substitutions (Clause 16 of the General supplemented)

16.1 Where a definite material or specialty is specified, it is not the intention to discriminate against products of other manufacturers, but rather to set a definite standard. Contractor's original bid shall be based upon the use of materials or specialties of such quality as

indicated. Any proposal for substitutions shall be made to the Project Supervisor in writing, together with the reasons therefor. Any substitution proposed following the award of the Contract must be made through the Change Order or Construction Change Directive procedures outlined in Clause 2 of the General Conditions. Proposals of substitutions shall be accompanied by samples and complete data, together with credit adjustments in Contract Price accruing to CRMWA Corp as a result of proposed substitutions.

SC.-21. Permits and Responsibilities (Clause 21 of the General Conditions supplemented)

21.1 In cases where Contract requirements are more stringent than, but are permitted under applicable ordinances, codes or regulations, the Contract provisions shall govern. In cases of conflict between referenced specifications or standards, the more stringent requirements shall govern.

SECTION 8

GENERAL REQUIREMENTS TO PROJECT

GENERAL REQUIREMENTS TO PROJECT

SECTION 1. GENERAL

1.1 Temporary Discharge, and Other Permits

a. Required Permits:

(1) Wastewater Discharge Permits:

(i) Notice of Intent to Discharge has been filed with the Surface Water Quality Bureau of the New Mexico Environment Department. Discharge of saline water during development of production wells or plugging of observation wells shall be diluted by water purchased by CRMWA from Ute Lake in accordance with the Notice of Intent.

(a) The Contractor shall provide all monitoring and water treatment, if necessary, to achieve compliance with permit conditions.

(b) The monitoring required of the Contractor to meet the New Mexico permit requirements may include sampling, as well as all required laboratory tests, to determine effluent characteristics.

(2) Section 404 Permit - The Army Corps of Engineers has authorized construction activities under a Nationwide Permit (NWP) No. 12 (Utility Line Discharges). Specific conditions of this permit applicable to construction under this contract include the following:

(i) Erosion and Siltation Controls - Appropriate erosion and siltation controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date.

(ii) Aquatic Life Movements - No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water.

(3) Section 401 Water Quality Certification - The Surface Water Quality Bureau of the State of New Mexico Environment Department has granted Section 401 water quality approval subject to the following conditions:

(i) The construction area must not have water running through it. If any work is to be done below the water level, flow must be diverted away from the work area with nonerodible materials. Suggested methods include, but are not limited to , the use of water bladders, boards, or concrete slabs.

(ii) Any heavy equipment used in the project area shall be steam cleaned prior to the start of the project and inspected daily for leaks. No leaking equipment may be used in or near surface water.

(iii) Fuel, oil, hydraulic fluid, or other substances of this nature shall not be stored within the normal flood plain and must have a secondary containment system to prevent spills if the primary storage container leaks.

(iv) The construction area must be protected such that a runoff event will not move any soil or other contaminant to surface water.

(v) The Contractor must be informed by the Surface Water Quality Bureau staff at a preconstruction meeting so the Contractor will know the specific requirements for maintaining water quality standards.

(vi) The Surface Water Quality Bureau must be notified at least seven days before the Contractor starts work to provide enough time for them to schedule monitoring if they deem it necessary.

(vii) The Surface Water Quality Bureau specifically reserves the right to amend or revoke their certification at any time to ensure the maintenance of water quality standards.

(4) The Contractor shall comply with all terms and conditions as stated in the permits.

(5) Monitoring. - The Contractor may be required to conduct monitoring in order to meet the requirements of the permits.

(6) Reporting results. - Copies of all information transmitted to the State will be sent to the Contracting Officer.

(7) Record keeping. - The Contractor shall retain all records and data required by the permits referred to in subparagraph a. above for the time period specified in the contract.

b. Cost. The cost of all work described in this paragraph shall be included in the prices bid in the schedule for other items of work.

1.2 Layout of Work

a. General. - The Contractor shall perform all layout surveys required for the control and completion of the work.

Primary control consists of the following intervisible bench marks:

Point	Northing	Easting	Elevation	Description	
101	1582699.48	775630.63	3791.78	12 CFL 1961	
201	1586977.90	775115.39	---------	TT-LOGAN-1978	
301	1582679.56	775627.70	3791.89	LMSC-1	
302	1583135.97	779809.00	3792.89	LMSC-2	
303	1582615.65	768596.75	3762.46	LMS-3	
4052	1582271.93	774539.46	3838.55	T304	(LMS-4)
4053	1582237.79	773918.39	3843.09	T305	(LMS-5)
4054	1583903.03	772890.21	3751.48	T306	(LMS-6)
4055	1583372.99	775226.76	3752.53	T3011	(LMS-1A)
4056	1580640.80	773612.38	3830.21	T3051	(LMS-5A)
4057	1578659.03	772956.84	3851.85	TA3051	(LMS-5B)

DESCRIPTIONS OF PRIMARY CONTROL:
Primary control consist of intervisible bench marks, a USGS bench mark 12 CFL 1961, 1.0 mile south of the south edge of Logan along the Rock Island and Pacific Railroad and on the south end of

the railroad bridge over the Canadian river. In the northwest corner of the south bridge abutment; a standard tablet stamped "12CFL 1961." Elevation 3791.78
New Mexico State Planes Coordinate East Zone. N-1,582,699.475 E-775,630.626

A USBR brass cap TT-Logan-1978, about 0.1 mile south of the south side of Logan near the middle of a highway curve, about 30 ft east of the top of the east highway cut bank. About 28 ft. west of the east right-of-way fence and 30 ft southwest of a fence corner. A standard brass cap stamped TT-LOGAN-1978 and set flush with the ground.
New Mexico State Planes Coordinate East Zone. N-1,586,977.901 E-775,115.386

LMSC-1 is a USBR point marked on the end of a vertical iron bar a few feet SW of 12 CFL 1961.

LMS-5A (T3051) is a surveyed and marked point located S-SW of the SE corner of the NE ¼ of the NE ¼ of Section 22, T. 13 N., R. 33 E.

LIST OF TBM'S:

No.	Elevation	Description
DB-1	3766.09	Railroad spike in power pole on north side highway 469 - 1st pp east of the AT&T buried telephone line crossing.
DB-2	3751.60	20 D nail in AT&T telephone sign post on the south side of the river on top hill above well TW-2
DB-3	3689.14	Railroad spike on the south side of well TW-2 - driven between surface casing and 6" pipe.
DB-4	3819.59	Railroad spike in the north side of power pole 120' north of highway 469 in 1st PP from the gate, on the south side of road to the gravel pit and well TW-3.
DB-5	3773.44	5/8" rebar located near the north section line of section 24, T13N, R33E, in an east-west fence line on road to the gravel pit and well TW-3, 40' west of centerline road.
DB-6	3736.79	5/8" rebar on the north side of a cedar tree on the west side of the road, 100' south of road turnoff to well TW-3.
DB-7	3690.53	Railroad spike set in rock 75' north of well TW-3, 10'east of high bank of river. Marked with a pile of rocks.
DB-8	3660.98	5/8" rebar in the river bottom 50' east from the river bank toe and 200' south of TW-3.
MJ-1	3808.37	High node on top railroad rail concreted in ground painted yellow @ NE corner intersection hwy 54 & state hwy 469
BLM	3817.27	Top of BLM brass cap on 22@ pipe at west 3 corner of section 22 T13N R33E in fence line.
BLM-1	3764.57	Top of BLM brass cap on 22@ pipe at NW corner of section 22 at north-south & east fence intersection.
PO-1	3794.90	Railroad spike in the centerline of the old asphalt road to pilot hole & injection well site #1, 0.4 feet west of fence and approx. 1320 from north section line

W-1	3817.58	Top of brass cap in concrete stamped w-1 200 feet SE of the dam tenders house
BM Logan North 1959	3817.98	Top of brass cap in concrete near the NW corner of section 15 on the south side of the hwy approx. 20 south of ROW fence.

NOTE:
One of the points in the series from LMS-4 through LMS-6 could not be found recently and may have been destroyed during road construction. One or more other points may also have been damaged or destroyed.

Before beginning work, the Contractor shall check and verify primary control, and discrepancies shall be resolved before proceeding.

The Contractor shall preserve and maintain primary control points until otherwise authorized. Primary control points damaged or destroyed by the Contractor prior to authorization may be reestablished by the PROJECT SUPERVISOR, and the expense of reestablishment will be deducted from amounts due, or to become due, to the Contractor.

The Contractor shall provide experienced construction surveyors, and survey work shall be under the supervision and direction of an engineer or surveyor with a minimum of 2 years responsible charge of construction surveys for construction similar in nature to that required by this contract. The Contractor shall maintain sufficient qualified personnel to perform required surveying work.

All survey work performed by the Contractor shall be subject to field and office review by the PROJECT SUPERVISOR.

b. Layout of work. - From established primary control points, the Contractor shall establish all lines and grades necessary to control the work, and shall be responsible for all measurements that may be required for execution of the work to the tolerances prescribed in these specifications and drawings or the Contractor's proposal.

The Contractor shall establish, place, and replace as required, such additional stakes, markers, and other controls as may be necessary for control, intermediate checks, and guidance of construction operations.

c. Accuracy. - Degree of accuracy shall be of an order high enough to satisfy tolerances commonly specified for this type work and the following:

(1) Structure points shall be set within 0.01 foot, except where installation or operation considerations require tighter tolerances.

(2) Vertical elevation surveys shall close within 0.05 foot times the square root of the circuit length in miles.

d. Materials and equipment. - The Contractor shall provide all materials and equipment required for surveying work, including, but not limited to, instruments, stakes, spikes, steel pins, templates, platforms, and tools, and except as required to be incorporated in the work or left in place, all such materials and equipment shall remain property of the Contractor.

e. Records. - Survey data shall be recorded in accordance with recognized professional surveying standards. Original field notes, computations, and other surveying data shall be recorded in approved field books. Notes or data not in accordance with standard formats will be rejected. Illegible notes or data, or erasures on any page of a field book will be considered

sufficient cause for rejection of part or all of the field book. Copied notes or data will not be permitted; therefore, rejection of part or all of a field book may necessitate resurveying. Corrections by ruling or lining out errors will be satisfactory.

f. Cost. - The cost of all material, equipment, and labor required for surveys for the layout of work required by this paragraph shall be included in the prices bid in the schedule for Mobilization.

SECTION 2. LOCAL CONDITIONS

2.1 Access to the Work and Haul Routes

a. General. - Rights-of-way for access to the work from existing roads will be provided by others. All work on the rights-of-way necessary for access to the site shall be performed by the Contractor.

The Contractor shall make his/her own investigation of the condition of available public or private roads and of clearances, restrictions, bridge-load limits, bond requirements, and other limitations that affect or may affect transportation and ingress and egress at the job sites. The unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of work. It shall be the Contractor's responsibility to construct and maintain, at the Contractor's own expense and at the Contractor's own risk, any haul roads, access roads, bridges, or drainage structures required for construction operations.

The project area consists largely of free range livestock grazing areas. It shall be the Contractor's responsibility to keep gates shut at all times or to arrange with land owners to temporarily or permanently replace such gates with cattle guards.

b. Existing roads. - Existing roads are available for the Contractor's use subject to existing restrictions. The Contractor shall meet all conditions properly imposed upon the use of existing roads by those having jurisdiction thereover, including (without limitation of the generality of the foregoing) seasonal or other limitations or restrictions, the payment of excess size and weight fees, and the posting of bonds conditioned upon repair of road damage caused by the Contractor. It shall be the Contractor's responsibility for any improvement to existing access roads required for construction purposes.

c. Haul routes. - The hauling of construction materials, or other intrajob hauling, over public highways, roads, or bridges shall be in compliance with the applicable local regulations and shall be such as to minimize interference with or congestion of local traffic. Where haul routes cross public highways or roads, the Contractor shall provide barricades, flagpersons, and other necessary precautions for safety of the public as provided in paragraph 3.1 (Safety of the Public).

d. Cost. - The cost of all work described in this paragraph shall be included in the prices bid in the schedule for other items of work.

2.2 Use of Land for Construction Purposes

a. General. - The Contractor will be permitted to use CRMWA Corp. controlled land for field offices, construction plant, storage yards, shops, and other facilities required for construction purposes.

All features to be designed and/or constructed under this contract shall be located within the confines of easements shown on Drawing 1253-514-1 (Land Status Map). All easements described on Drawing 1253-514-2 (Land Status Map Explanation) allow for the permanent construction of pipelines, pumping plants and facilities south of the Canadian River. These maps will be provided to the awarded bidder.

If land other than CRMWA Corp. controlled land is used by the Contractor for construction facilities or other purposes, the Contractor shall make all necessary arrangements with the owner and shall pay all rentals or other cost connected therewith.

b. CRMWA Corp. controlled land. - The Contractor's use of CRMWA Corp. controlled land for construction purposes shall be subject to the applicable requirements of the contract clauses, Section 4. (Environmental Quality Protection) of these specifications, and to the requirements of this paragraph. Such use shall not interfere with any part of the work under this contract, nor with the work of other contractors.

The Contractor's construction facilities shall be arranged and operated in a manner to preserve and protect existing features, trees, and vegetation to the maximum extent practicable. The location, construction, maintenance, operation, and removal of the Contractor's construction facilities on CRMWA Corp. controlled land shall be subject to the approval of the PROJECT SUPERVISOR.

Housing for Contractor personnel will not be permitted on CRMWA Corp. controlled land, except as may be approved by the PROJECT SUPERVISOR.

Upon completion of the work, and following removal of construction facilities and required cleanup, CRMWA Corp. controlled land used for construction purposes and not required for the completed installation shall be regraded in accordance with paragraph 4.1 (Landscape Preservation.)

c. Cost. - No charge will be made to the Contractor for the use of CRMWA Corp. controlled land for construction purposes. If the Contractor elects to use land other than CRMWA Corp. controlled land for construction purposes, all costs associated therewith shall be borne by the Contractor.

2.3 Maintaining Public Traffic

a. General. - The Contractor shall make all necessary provisions for maintaining the flow of public traffic and shall conduct operations under these specifications so as to offer the least possible obstruction and inconvenience to public traffic. Public traffic shall be permitted to cross over and pass through construction operations at all times with as little inconvenience and delay as possible and the Contractor shall, when ordered, provide and station competent flagpersons whose sole duties shall consist of direction and controlling the movement of public traffic either through or around the work.

Where public traffic will be required to cross over or pass through the work, construction operations shall be conducted so as to provide a reasonable smooth and unobstructed passageway for one line of traffic at all times. At any and all points along the work where the nature of the construction operations in progress and the equipment and machinery in use are of such character as to endanger passing traffic, the Contractor shall avoid damage or injury to passing traffic.

b. Cost. - The cost of all work involved in maintaining public traffic, as described in this paragraph and paragraph 3.1 (Safety of the Public), shall be included in the prices bid in the schedule for other items of work.

2.4 Protection Of Existing Installations

a. General. - The Contractor shall take all necessary precautions to safeguard existing installations which are to remain in place. The Contractor shall obtain the location of buried conduit, pipe, cable, ground mat, and other buried items prior to performing any excavations in or near the existing installations and shall use proper methods for their protection during excavating and backfilling operations. The Contractor shall protect adjacent installations when installing equipment and materials.

The Contractor shall be responsible for and shall repair, at his expense, any damage to existing installations due to the Contractor's operations or his failure to provide proper protection; or at the option of the PROJECT SUPERVISOR, any such damage may be repaired by CRMWA Corp., and the Contractor will be backcharged for the cost thereof.

b. Cost. - The cost of all protection, as described in these specifications, including furnishing all necessary materials, shall be included in the prices bid in the schedule for other items of work.

2.5 Construction at Existing Railroad and Utilities

a. General. - Where the work to be performed under these specifications crosses or otherwise interferes with water, sewer, gas, or oil pipelines; electrical lines; overhead or buried utility cables; other public or private utilities; or with railroads, the Contractor shall provide for such utilities and railroad, and shall perform such construction during the progress of the work so that no damage will result to either public or private interests. It shall be the responsibility of the Contractor to determine the actual locations of and make provision for all utilities and the railroad.

Before the railroad or any utility is crossed, taken out of service, or modified in any way, permission shall be obtained from the owner. The Contractor shall be liable for all damage that may result from failure to provide for the railroad or utilities during the progress of the work, and the Contractor shall indemnify and hold harmless CRMWA Corp. from claims of whatsoever nature or kind arising out of or connected with damage to the railroad or utilities encountered during construction, damages resulting from disruption of service, and injury to persons or damage to property resulting from the negligent, accidental, or intentional breaching of the railroad or utilities.

If the Contractor does not maintain the existing railroad and utilities in such condition that no damage will result to either public or private interests, CRMWA Corp. will cause the necessary repairs to be made and back charge the Contractor for such work.

b. Cost. Except as otherwise provided below, the cost of all work described in this paragraph shall be included in the prices bid in the schedule for other items of work.

2.6 Railroad Crossing

An Underground Pipeline Crossing Agreement (Folder No. 1617-77) has been fully executed by the Union Pacific Railroad Company (successors and assigns of the Southern Pacific Railroad Company). The Contractor shall comply with all terms of this Pipeline Crossing Agreement. A copy of this Pipeline Crossing Agreement may be obtained from CRMWA Corp. This Pipeline Crossing Agreement requires the Contractor to execute the Licensor's form Contractor's Right of Entry Agreement and understand its terms, provisions, and requirements. Under no circumstances will the Contractor enter railroad right-of-way without first executing this Contractor's Right of Entry Agreement.

The Contractor shall furnish public liability and property damage insurance before beginning construction on railroad right-of-way. The Contractor shall provide to the Union Pacific Railroad a Certificate of Insurance certifying to the effectiveness of insurance as follows:

General Public Liability providing bodily injury and property damage coverage with combined single limit of at least $1,000,000 each occurrence, a portion of which may be self-insured with the consent and approval of the Union Pacific Railroad. The Contractor will also provide a Certificate of Insurance issued by its insurance carrier confirming the existence of such insurance and that the policy or policies contain the following endorsement:

> Union Pacific Railroad Company shall be named as an additional insured with respect to all liabilities arising out of the existence, use or any work performed on or associated with the Pipeline located on the Railroad right-of-way at Mile Post 616.63 on the Dalhart Subdivision at or near Logan, NM.

Such insurance shall be endorsed to provide contractual liability assumed by the Licensee under this Agreement, and that coverage shall not be canceled or changed without giving thirty (30) day's prior written notice to:

> Folder No. 1617-77
> Union Pacific Railroad Company
> 1416 Dodge Street, WP001
> Omaha, Nebraska 68179-1100

The Contractor shall notify the Railroad at least ten (10) days (or such other time as the Railroad may allow) in advance of the commencement of any work upon property of the Railroad in connection with the construction of the pipeline. All such work shall be prosecuted diligently to completion.

2.7 Electric Power for Construction Purposes

a. General. - The Contractor shall make all necessary arrangements and shall provide all electric power required for construction purposes. This shall include providing all necessary transmission lines, distribution circuits, transformers, portable generators, and other electrical equipment required for supplying and distributing power to the place or places of use by the Contractor.

At the termination of the contract under these specifications, the Contractor shall dismantle and remove all distribution lines serving the Contractor's installations, or those of the Contractor's subcontractors, that are not part of the permanent power installation.

b. Cost. - No direct payment will be made to the Contractor for providing electric power for construction purposes, and the cost thereof shall be included in the prices bid in the schedule for other items of work.

2.8 Water for Construction Purposes

a. General. - The Contractor shall furnish all water required for construction purposes. The Contractor shall make all arrangements for obtaining water and provide all means for conveying water to points of use. The Contractor shall provide all facilities for obtaining water and shall transport water to the points of use.

b. Cost. - The cost of furnishing water, providing necessary facilities and conveying water to points of use shall be included in the prices bid in the schedule for other items of work.

2.9 Geologic Investigations

a. General. - CRMWA Corp. does not represent that the samples, logs, water-level data, and other available geologic and hydrologic information show the conditions that will be encountered in performing the work. CRMWA Corp. represents only that such information (not including geophysical data) shows conditions encountered at the particular point from which such information was obtained. Information collected from surface geophysics should only be used as an indication of geologic conditions that exist at depth. CRMWA Corp. does not represent that these data will show the exact condition that will be encountered at any particular horizon. The water-level data show only the conditions at the particular time or times the information was obtained and may not indicate variations such as those caused by periods of drought or increased rainfall, seasonal fluctuations in rainfall, or application of irrigation water. It is expressly understood that the making of deductions, interpretations, nature of the materials to be excavated or drilled, the difficulties of making and maintaining the required excavations, and the difficulties of doing other work affected by the geology, water-level elevations, and other subsurface conditions at the site of the work, are the Contractor's sole responsibility.

SECTION 3. SAFETY

3.1 Safety Of The Public

Roads subject to interference by the work shall be kept open or suitable detours shall be provided and maintained by the Contractor. The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient flasher lights, flagpersons, danger signals, and signs, and shall take all necessary precautions for the protection of the work and the safety of the public.

Roads closed to traffic shall be protected by effective barricades on which shall be placed acceptable warning and detour signs. All barricades and obstructions shall be illuminated at night and all lights shall be kept burning from sunset until sunrise.

No construction work along public or private roads may proceed until the Contractor has proper barricades, flasher lights, flagpersons, signals, and signs in place at the construction site.

The cost of complying with this paragraph shall be included in the prices bid in the schedule for other items of work.

SECTION 4. ENVIRONMENTAL QUALITY PROTECTION

4.1 Landscape Preservation

a. General. - The Contractor's construction facilities and operations, as well as those of persons or parties operation or associated with the Contractor, on CRMWA Corp. controlled land shall be subject to the applicable requirements of the contract clauses, this section, and the requirements of this paragraph.

The Contractor shall exercise care to preserve the natural landscape and shall conduct construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the

natural surroundings in the vicinity of the work. Movement of crews and equipment within the right-of-way and over routes provided for access to the work shall be performed in a manner to prevent damage to grazing land, crops, or property. When no longer required, construction roads shall be restored to original contours and made impassable to vehicular traffic.

The Contractor shall, to the extent practical, avoid construction of temporary access roads by use of appropriate off-road equipment or other techniques. Where temporary road construction is absolutely necessary, such construction shall be performed so as to minimize adverse impacts to the habitat.

b. Regrading. - Upon completion of the work, and following removal of construction facilities and required cleanup, CRMWA Corp. controlled land used for construction purposes and not required for the completed installation will be scarified and regraded, as required, so that all surfaces blend with the natural terrain and are left in a condition that will provide for proper drainage, and prevent erosion.

c. Replanting. - On completion of the regrading work required above, the Contractor shall replant CRMWA Corp. controlled land used for construction purposes and not required for the completed installation and any other areas where vegetation has been destroyed or damaged by the Contractor's operations. The replanting shall consist of revegetating the area with the same species of native plants, or other approved locally adapted perennial species, and shall be accomplished in a manner as recommended by an experienced local horticulturist. No payment will be made for replanting the area described herein.

d. Cost. - The cost of all work required by this paragraph shall be included in the prices bid in the schedule for other items of work, except that the cost of any work required by the Contractor's negligence shall be borne by the Contractor.

4.2 Prevention of Water Pollution

a. General. - The Contractor's construction activities shall be performed by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, and other pollutants and wastes into streams, flowing or dry watercourses, lakes, and underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, and thermal pollution. Saline water collected from production wells and observation wells during drilling, development, testing and/or plugging will be disposed of in accordance with the Notice of Intent to Discharge filed with the State of New Mexico. Any disposal of saline water into river shall be approved and coordinated with the PROJECT SUPERVISOR.

Excavated materials or other construction materials shall not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff, or can in any way encroach upon the water course itself.

The Contractor's method of unwatering, excavation, or stockpiling earth and rock materials shall include prevention measures to control silting and erosion, and to intercept and settle any runoff of sediment-laden waters. Wastewater from general construction activities, such as drain water collection, aggregate processing, concrete batching, drilling, grouting, or other construction operations, shall not enter flowing or dry watercourses without the use of approved turbidity control methods. These methods include, but are not restricted to, intercepting ditches, settling ponds, gravel-filter entrapment dikes, approved flocculating processes, recirculation, combination thereof, or other approved methods that are not harmful to aquatic life.

b. Laws, regulations, and permits. - The Contractor shall comply with applicable Federal and State laws, orders, regulations, and water-quality standards concerning the control and abatement of water pollution and in the event there is a conflict between State and Federal laws, regulations, and requirements, the most stringent shall apply. Consistent violations of applicable Federal or State laws, orders, regulations, or water-quality standards shall result in the PROJECT SUPERVISOR stopping all site activity until compliance is assured. The Contractor shall not be entitled to any extension of time, claim for damage, or additional compensation by reason of such a work stoppage. Corrective measures required to bring activities into compliance shall be at the Contractor's expense.

Where the location of a construction site is such that oil from an accidental spillage could reasonably be expected to enter into or upon the navigable waters of the United State or adjoining shorelines, and the aggregate storage of oil at the site if over 1,320 gallons or a single container has a capacity in excess of 660 gallons, the Contractor shall prepare a SPCC (Spill Prevention Control and Countermeasure) plan, and the plan shall be reviewed and certified by a registered professional engineer in accordance with 40 CFR, part 112, as required by Public Law 92-500 as amended. All oil storage tanks shall be placed at least 20 feet from streams, flowing or dry watercourses, lakes, wetlands, reservoirs, and any other water source, and the area surrounding the tanks shall be diked to contain more than 1-1/2 times the volume of the largest tank, or more than half the volume of all the tanks within the diked area, whichever is greater. Underground storage tanks shall be used only upon submission and approval of a written management plan documenting all necessary regulatory compliance. Underground oil storage tanks shall be protected from corrosion by cathodic protection, material construction, or other approved method.

The Contractor shall be responsible for preparing a Storm Water Pollution Prevention Plan (SWPPP) to comply with certain storm water pollution prevention and control measures specified in the National Pollutant Discharge Elimination System (NPDES) Storm Water Construction General Permit Coverage Notice, Permit Number NMR10B336. A copy of the SWPPP shall be sent to CRMWA Corp. for approval before filing with the EPA.

c. Cost. - The cost of complying with this paragraph shall be included in the prices bid in the schedule for the various items of work.

4.3 Dust Abatement

a. General. - During the performance of the work required by these specifications or any operations appurtenant thereto, whether on right-of-way provided by CRMWA Corp. or elsewhere, the Contractor shall comply with applicable Federal, State, and local laws and regulations, and with the requirements of this paragraph regarding the prevention, control and abatement of dust pollution. Should a conflict exist in the requirements for dust abatement, the most stringent requirements shall apply. The Contractor shall be responsible for all damages resulting from dust originating from Contractor operations under these specifications.

The Contractor shall provide all labor, equipment, materials, and shall use efficient measures wherever and whenever required to prevent dust nuisance or damage to persons, property, or activities, including, but not limited to, crops, orchards, cultivated fields, wildlife habitats, dwellings and residences, agricultural activities, recreational activities, traffic, and similar conditions.

The PROJECT SUPERVISOR has the authority to stop any construction activity contributing to dust levels which are excessive or in violation of Federal, State, or local laws. All expenses resulting from such a work stoppage shall be the responsibility of the Contractor.

b. Cost. - The cost of complying with this paragraph shall be included in the prices bid in the schedule for other items of work.

4.4 Preservation of Historical and Archeological Data

a. General. Federal legislation provides for the protection, preservation, and collection of scientific, prehistorical, historical, and archeological data, including relics and specimens, which might otherwise be lost due to alteration of the terrain as a result of any Federal construction project.

Should the Contractor, or any of the Contractor's employees, or parties operating or associated with the Contractor, in the performance of this contract discover evidence of possible scientific, prehistorical, historical, or archeological data, the Contractor shall immediately cease work at that location and notify the Contracting Officer, giving the location and nature of the findings. The Contractor shall forward written confirmation to the PROJECT SUPERVISOR within 2 days. The Contractor shall exercise care so as not to disturb or damage artifacts or fossils uncovered during excavation operations, and shall provide such cooperation and assistance as may be necessary to preserve the findings for removal or other disposition by CRMWA Corp.

If the contractor proposes to use a location other than an approved location (approved locations to be provided by the PROJECT SUPERVISOR), the location(s) must first be approved for use by the PROJECT SUPERVISOR, to assure that cultural resources are not impacted. When considering an unapproved use area or borrow source, the contractor shall submit a map showing the location to the PROJECT SUPERVISOR in advance of any proposed use. The contractor or his subcontractors shall take no action to use or alter the proposed location until written approval is provided by the PROJECT SUPERVISOR.

Any person who, without permission, injures, destroys, excavates, appropriates, or removes any historical or prehistorical artifact, object of antiquity, or archeological resource on the public lands of the United States is subject to arrest and penalty of law.

Where appropriate by reason of discovery, the PROJECT SUPERVISOR may order delays in the time of performance or changes in the work, or both. If such delays or changes are ordered, an equitable adjustment will be made in the contract in accordance with the General Conditions.

The Contractor shall be responsible to ensure that all subcontractors comply with the requirements of this section which involve the performance of work on the terrain of the site.

There are known archeological sites within the project area. CRMWA will flag areas to restrict/control traffic outside established road (trail) corridors. Traffic will be restricted to roads and parking will be designated in the river floodplain or at the bluff top within the quarry area.

b. Cost. Except as provided above, the cost of complying with this paragraph shall be included in the prices bid in the schedule for other items of work.

4.5 Pesticides

a. General. - Pesticides include herbicides, insecticides, fungicides, rodenticides, piscicides, avicides, surface disinfectants, animal repellents, and insect repellents.

Pesticides shall be only those registered with the EPA (Environmental Protection Agency) in compliance with the Federal Environmental Pesticide Control Act of 1972, or with State or local agencies.

The Contractor shall keep records of the types and amounts of pesticides purchased, delivered, stored, mixed, and actually used, and the means of disposal of all excess. These records shall be kept current and accurate, and shall be available for review by the PROJECT SUPERVISOR.

The Contractor shall be responsible for all damages resulting from the use of pesticides under these specifications.

Submittals. - Submittals shall be in accordance with this paragraph.

(1) At least 30 days prior to the application of the first pesticide, the Contractor shall submit, for approval, a pesticide use plan for all pesticides proposed for use: except, no plan or approval will be required for insect repellents to be applied directly to clothing, or for small quantities of aerosol insecticides, such as fly and spider sprays, to be applied within or directly to offices or shop buildings.

The pesticide use plan shall include the following for each proposed pesticide:

(i) Pesticide Use Proposal Form 7-2223, completed by the entity to be responsible for application of the pesticide.

(ii) The complete "label" of the proposed pesticide, as defined by the Federal Insecticide Fungicide Rodenticide Act of 1947, as amended in 1972 and 1978, containing the following:

(a) Brand, common, and chemical names.

(b) Ingredients and net contents.

(c) Use classification and registered uses.

(d) Name and address of manufacturer or registrant, EPA registration number, and the establishment number.

(e) Directions for use, including safety information, warnings, and precautions.

(iii) A copy of the Material Safety Data Sheet as required by Clause 21 of the General Conditions.

(2) The following chemicals or applications shall not be used:

(i)Chemicals categorized by the EPA for "restricted use."

(ii) Chemicals applied to, or that can reasonably be expected to contact, water: except, this requirement shall not apply to "Rodeo" or copper sulfate used for the control of noxious weeds.

(iii) Chemicals expected to endanger threatened animal or plant species.

(iv) Applications involving 2,560 acres or more in one application.

One copy of the pesticide use plan and transmittal letter shall be submitted to CRMWA Corp.

b. Storage, mixing, and application. - The Contractor shall read and comply with all labeling and Material Safety Data Sheet requirements when dealing with pesticides.

Pesticides shall be considered harmful chemicals, and should a conflict exist in the requirements for dealing with pesticides, the most stringent requirement shall apply.

c. Cost. - Except as specified above for damages, the cost of complying with this paragraph shall be included in the prices bid in the schedule for other items of work.

4.6 Cleanup and Disposal of Waste Material

a. General. - The Contractor shall be responsible for the cleanup and disposal of waste materials and rubbish. The disposal of waste materials and rubbish shall be in accordance with applicable Federal, State, and local laws and regulations, and with the requirements of this paragraph. Should a conflict exist in the requirements for cleanup and disposal of waste materials, the most stringent requirement shall apply.

The Contractor shall keep records of the types and amounts of waste materials produced, and of the disposal of all waste materials on or off the job site.

In the event of the Contractor's failure to perform the work required by this paragraph, the work may be performed by CRMWA Corp., and the Contractor will be back charged for the cost of such work. The Contractor's surety or sureties shall be liable for such payment until received by CRMWA Corp.

b. Cleanup. - The Contractor shall keep work and storage areas free from accumulations of waste materials and rubbish, and before completing the work, shall remove all plant facilities, buildings, including concrete footings and slabs, rubbish, unused materials, concrete forms, and other like materials, which are not a part of the permanent work.

Upon completion of the work, and following removal of construction facilities and required cleanup, work areas shall be regraded and left in a neat manner conforming to the natural appearance of the landscape in accordance with paragraph 4.1 (Landscape Preservation).

In addition, the Contractor will be required to conduct an environmental site assessment at the following Contractor use locations:

(1) All hazardous waste accumulation areas;

(2) All hazardous material and petroleum dispensing and storage areas where the aggregate storage of hazardous materials or petroleum at the site is or has been over 110 gallons.

This site assessment shall be performed by a qualified environmental consultant or equivalent and shall document through appropriate analytical sampling that the site is free of the effects of contamination (i.e., contaminant concentrations less than State action cleanup levels).

c. Disposal of hazardous waste and materials. - Materials or wastes, defined as hazardous by 40 CFR 261.3; Federal Standard 313, as amended; or by other Federal, State, or local laws or regulations, used by the Contractor or discovered in work or storage areas, shall be disposed of in

accordance with these specifications and applicable Federal, State, and local laws and regulations. Unknown waste materials that may be hazardous shall be tested, and the test results shall be submitted to the PROJECT SUPERVISOR for review.

Waste materials known or found to be hazardous shall be disposed of in approved treatment or disposal facilities. Hazardous wastes shall be recycled whenever possible. A copy of all hazardous waste manifest shall be sent to the PROJECT SUPERVISOR.

Waste materials discovered at the construction site shall immediately be reported to the PROJECT SUPERVISOR. If the waste may be hazardous, the PROJECT SUPERVISOR may order delays in the time of performance or changes in the work, or both. If such delays or changes are ordered, an equitable adjustment will be made in the contract in accordance with the applicable clauses of the contract.

d. Disposal of other nonhazardous waste materials. -

(1) General. - Waste materials including, but not restricted to, refuse, garbage, sanitary wastes, industrial wastes, and oil and other petroleum products, shall be disposed of by the Contractor. Disposal of combustible materials shall be by removal from the construction area. Disposal of combustible materials by burning will not be permitted. Disposal of noncombustible materials shall be by removal from the construction area.

(2) Disposal by removal. - Waste materials to be disposed of by removal from the construction area shall be removed prior to coition of the work under these specifications. All materials removed shall become the property of the Contractor.

Where waste materials are to be dumped, they shall be dumped only at an approved sanitary landfill. The Contractor shall make any necessary arrangements with private parties and county officials pertinent to locations and regulations of such landfills, and shall pay any fees or charges required for such dumping.

e. Cost. - Except as provided above, the cost of cleanup and disposal of waste materials in accordance with this paragraph shall be included in the prices bid in the schedule for other items of work.

SECTION 9

EXHIBIT A - INSURANCE REQUIREMENTS

EXHIBIT A
INSURANCE REQUIREMENTS

Upon award of contract, have your insurance carrier forward a complete **Certificate of Insurance** that includes:

1) The statement, "CRMWA Corp. is Certificate Holder"

2) The statement, "Certificate holder is named as additional Insured on Excess Liability, Automobile Liability, and Commercial General Liability policies"

3) The statement, "A waiver of subrogation is granted in favor of CRMWA Corp. on Excess Liability, Automobile Liability, Commercial General Liability, and Workers Compensation/Employer's Liability policies"

4) Meets the requirements of Sec. 2.6 of General Requirements.

Mail the Certificate to CRMWA Corp. at the address listed below. The Certificate of Insurance must be on file before work can proceed.

General Liability:	$ 1,000,000
Worker's Compensation:	Proof of worker's compensation insurance in the amounts sufficient to meet the requirements of the laws of the State of New Mexico.
Automobile Liability:	$ 1,000,000
Excess Liability:	$ 3,000,000
Builders Risk:	Provide copy of Policy showing limits equal to contract amount - See General Conditions Clause 27 (b) (vii)

CRMWA Corp.
P.O. Box 9
Sanford, Texas 79078

SECTION 10

EXHIBIT B - MINIMUM WAGES

WAGE RATES

The attached labor classifications and minimum wage scale is herein below determined by the Authority in accordance with the statutory requirements as prevailing local wages and shall govern on all public construction work performed by the successful bidding Contractor and his sub-contractors in connection with the work covered by this contract. *The Contractor shall pay the wage rate scales which apply to the different areas of work involved with the project.*

The attached are minimum rates. Bidders shall base their bid on rates they expect to pay if in excess of those listed. The Authority will not consider claims for extra payment to the Contractor on account of payment of wages higher than above specified.

Any work performed by any laborer, workman or mechanic In excess of forty (40) hours per week shall be paid for at one and one-half (1-1/2) times the regular rate.

TITLE 11 LABOR AND WORKERS' COMPENSATION
CHAPTER 1 LABOR GENERAL PROVISIONS
PART 1 PUBLIC WORKS MINIMUM WAGE ACT POLICY MANUAL

1. **ISSUING AGENCY:** New Mexico Department of Labor, Labor and Industrial Division, Public Works Bureau. [8-15-98]

2. **SCOPE:** All contractors, subcontractors, employers or any person acting as a contractor who employs laborers or mechanics on Public Works Projects. [8-15-98]

3. **STATUTORY AUTHORITY:** Section 13-4-11(C), New Mexico Statutes Annotated, 1978 Compilation. [8-15-98]

4. **DURATION:** Permanent [8-15-98]

5. **EFFECTIVE DATE:** May 31, 1972, unless a later date is written at the end of section or paragraph. [8-15-98]

6. **OBJECTIVE:**
The purpose of this rule is to define regulations necessary for the application of prevailing wage rates for laborers and mechanics employed on public works projects in the state including procedures for the predetermination of wages, survey categories and wage rate differentials, the adoption of job classification descriptions and procedures for the disposition of appeals brought under the Public Works Minimum Wage Act. Regulations pertaining to Apprentices and Trainees and Permanent Job Classifications and Descriptions for Public Works Projects are also contained in this rule. [8-15-98]

7. **DEFINITIONS:** Reserved [8-15-98]

8. **PREAMBLE**
Substantial evidence gathered from past surveys supports the conclusions that industry wage practices on projects within the Type "A" construction classification are generally uniform throughout the state and that the statewide survey process is an adequate process to ascertain prevailing wage rates on projects within the Type "A" construction classification. Moreover, no concern has been expressed, either before the legislature or in public hearings preceding the adoption of these and predecessor regulations, that statewide surveys are not suitable for ascertaining prevailing wage rates on heavy engineering projects within the Type "B" construction classification ("Type 'B' - Heavy Engineering"), and industry evidence is that industry wage practices on Type "B" - Heavy Engineering projects are generally uniform throughout the state.

As noted, concern as to the suitability of the statewide survey process relates principally, if not solely, to commercial building projects (generally of smaller size) and to residential

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construction projects within the Type "B" classification (both Type 'B'- Building"). The only evidence presented by the industry in public hearings preceding the adoption of these and predecessor regulations is in complete support of the use of statewide surveys for ascertaining prevailing wage rates on Type "B" - Building projects.

Based upon the substantial evidence of industry practice summarized above, these regulations provide for a statewide survey process for Type "A" construction and for all projects (both building projects and heavy engineering projects) within the Type "B" construction classification. However, in view of the concerns expressed before the legislature, this office will encourage wider submission of wage information and will undertake to evaluate the wage information gathered during the course of its semi-annual surveys to determine, based upon hard evidence of industry practice gathered during the survey process, (1) whether minimum wage rates determined by the statewide survey process do or do not substantially reflect the prevailing wage rates being paid on Type "B" - Building projects throughout the state, and (2) whether certain kinds of residential construction projects do or do not constitute contract work of a nature similar to other Type "B" - Building projects. Each annual report to the governor required by Laws 1979, Chapter 204, Section 10 (850-1-7.1, NMSA 1978), shall include a report concerning the administration of the Public Works Minimum Wage Act including a report concerning the above undertaking. If, after sufficient data have been gathered and evaluated, substantial evidence does not support the continued use of the statewide survey process for ascertaining prevailing wage rates on Type "B" - Building projects (or on certain kinds of residential construction projects within that classification) and/or the continued classification as Type "B" - Building of certain kinds of residential construction projects, appropriate changes to these regulations will be recommended for adoption after notice and public hearing as required by law and applicable regulations. [6-4-79]

9. Description of Types of Construction for which Predetermined Wage Rate Decisions Will Be Issued.

9.1 Purpose and Scope
The regulations contained in this part classify the types of construction work of a similar nature for which predetermined wage rate decisions will be issued by the Director for public works subject to the Public Works Minimum Wage Act. [5-31-72, 6-4-79, 1-29-81, 5-28-81, 11-4-88]

9.2 Classifications of Construction Work [5-31-72]

9.2.1 The street, highway, utility and light engineering construction classification shall include the construction, alteration, repair and demolition of roads, streets, highways, alleys, sidewalks, curbs, gutters, guard rails, fences, parkways, parking areas, airports (other than buildings thereon), bridle paths athletic fields; highway bridges, median channels, and grade

separations involving highways; parks, golf courses, viaducts; uncovered reservoirs and uncovered sewage and water treatment facilities; canals, ditches and channels (including linings other than concrete linings); earth dams under one million (1,000,000) cubic yards; well drilling, telephone and electrical transmission lines and site preparations which are part of street, highway, utility and light engineering projects; and shall include construction, alteration, repair, and demolition of utilities such as sanitary sewers, storm sewers, water lines, including appurtenances thereto such as lift stations, inlets, manholes, sewer lagoons, septic tanks and service outlets (stub-outs), providing such utility construction is outside the property line, or more than five (5) feet from a building or heavy engineering structure, whichever is closer, provided, however, with regard to electrical utilities such construction shall include construction to the first attachment of incoming power source without regard to the property line or proximity to the building or the heavy engineering structure. Furthermore, this limitation will not apply to independent main lines and service out-lets (stub-out regardless of proximity to building or heavy engineering structure; construction and installation of pipelines (except cross-country transportation mainline pipelines), including municipal-type utility distribution pipelines, for the distribution of petroleum and/or natural gas, up to the first metering station or connection with the transportation mainline pipeline; provided, "First metering station or connection" means that point which divides cross-country transportation mainline transmission lines or higher pressure lateral and branch lines from lower pressure distribution systems. [5-31-72, 1-29-81, 5-28-81, 11-4-88]

9.2.2 The general building and heavy engineering construction classification shall include the construction, alteration, repair and demolition of buildings, including office buildings, warehouses, industrial and commercial buildings, institutional and public buildings and all air-conditioning, conduit, heating and other mechanical and electrical works and site preparation for buildings or heavy engineering projects under this classifications; except that construction, alteration, repair and demolition of buildings under the scope of this classification shall not include construction, alteration, repair and demolition of buildings under the class "C" classification of section 9.2 of these regulations; stadia; and shall include electrical, gas, water, sewer lines, and other such utility construction which are part of projects under this classification and included within the property line or less than five (5) feet from the building or heavy engineering structure, whichever is closer, provided, however, with regard to electrical utilities such construction shall include construction from the first attachment of incoming power source without regard to the property line or proximity to the building or heavy engineering structure; and shall include construction, alteration, repair and

demolition of heavy engineering work such as power generating plants, pump stations, natural gas compressing stations; covered reservoirs and covered sewage and water treatment facilities; concrete linings for canals, ditches and channels; concrete dams; earth dams of one million (1,000,000) cubic yards or over; radio towers, ovens, furnaces, kiln, silos, shafts and tunnels (other than highway shafts and tunnels), hydroelectric projects: and well drilling, telephone and electrical transmission lines which are part of general building and heavy engineering projects; mining appurtenances such as tipples, washeries and loading and discharging chutes, and specialized structures for testing, launching and recovering space and other rocket-type missiles; construction and installation of cross-country transportation mainline pipelines for the distribution of petroleum and/or natural gas, up to the first metering station or connection with the distribution pipelines; provided, "first metering station or connection" means that point which divides cross-country transportation mainline transmission lines or higher pressure lateral and branch lines from lower pressure distribution systems. [5-31-72, 5-28-81, 11-4-88]

9.2.3 The residential building construction classification shall include the site preparation and construction, alteration; repair and demolition of residential buildings and shall include all structures intended for residential occupancy, be it by owners of said properties or tenants, including, but not limited to, single detached buildings, duplexes, tri-plexes, quad-plexes, residential condominium buildings, apartment buildings not to exceed four stories in height; and shall include electrical, gas, water, sewer lines, and other such utility construction which are part of projects under this classification and included within the property line or less than five (5) feet from the Building, whichever is closer. [5-28-81]

9.3 Providing for More Than One (1) Wage Scale

On contracts which involve more than one (1) classification of construction, as defined in Paragraph 9.2, supra, the Director shall issue predeterminations, including therein the appropriate wage rates for each classification of construction where none of the classifications comprises eighty percent (80%) of the total contract cost. Where one classification comprises eighty percent (80%) or more of the total contract cost, the predetermined rate for that classification shall be used for the entire contract. [5-31-72, 6-4-79, 11-4-88]

10. Powers and Duties of the Director and of the Contracting Agencies in the Administration of the Public Works Minimum Wage Act.

LABOR CLASSIFICATION GROUPS
TYPE "A" CONSTRUCTION
PAGE 1

GROUP I - (Unskilled):

Building & Common Laborer; Carpenter Tender Chainman; Rodman; Stakedriver; Concrete Buggy Operator (hand); Concrete Workers; Flagman; Soil Sample Tester.

GROUP II – (Semi-skilled):

Wagon, Air Tract, Drill & diamond Drillers' Tender (Outside); Air & Power Tool Man (not a carpenter's tool); Asphalt Heaterman; Asphalt Jointman; Asphalt Raker; Batching Plant Scaleman; Tenderers (To Cement Mason & Plasterer); Chain Sawman; Concrete Power Buggyman; Concrete Touch-up Man; concrete Sawman – Coring Mach.; Curbing Machine, Asphalt or Cement; Cutting Torchman; Metal Form Setter-Road; Grade Setter; Hod Carrier; Mortar Mixer & Mason Tender; Powderman or Blaster Helper; Sandblaster; Scaler; Vibratorman (Hand type); Vibratory Compactor (Hand type); Window Washer; Nurseryman-Gardener; Wagon, Air Tract, Drill & Diamond Driller (Outside); Roadway Hardware Worker.

GROUP III – (Miscellaneous):

Gunite Pumpcrete Man & Nozzleman; Multi-plate Setter; Manhole Builder; Pipelayer; Powderman-Blaster-Makeup; Landscaper; Traffic Control Technician; Laboratory Technician.

EQUIPMENT OPERATOR CLASSIFICATION GROUPS

GROUP I:

Concrete Paving Curing Machine

GROUP II:

Belt Type Conveyors (Material & Concrete); Broom (Self Prop.); Fork Lift; Grease Truck Operator; Head Oiler; Hydro Lift; Tractor (Under 50 Drawbar HP with or without Attach.); Industrial Locomotive Brakeman; Front End Loader (2 CY or less); Fireman; Oiler; Screedman; Roller (Pull Type); Mulching Machine, Roller (Self-Propelled).

GROUP III:

Concrete Paving Form Grader; Concrete Paving Gang Vibrator; Concrete Paving Joint or Saw Machine; Concrete Paving Sub Grader; Tractor with Backhoe Attachment; Subgrade or Base Finisher; Power Plant (Electric Generator or Welding Machine).

EQUIPMENT OPERATORS CONT'D.
PAGE 2

GROUP IV:

Bulldozer (including self-propelled roller with dozer attachment); Batch or Continuous Mix Plant (Concrete, soil cement; or asphalt); Roller (Steel Wheel); Front End Loader (2 – 10 CY); Scraper Operator; Motor Grader.

GROUP V:

Asphalt Distributor; Asph. Paving or Laydown Machine; Asph. Retort Heater; Mixer, Heavy Duty, Asph. Or Soil Cement; Trenching Mach.; Clam Type Shaftmucker; Backhoe, Clamshell, Dragline, Gradall, Shovel (under ¾ CY); Elevating Grader or Belt Loader; Cranes (Crawler or Mobile) under 20 tons; Air Compressor (300 CFM 7 Over); Crushing Screening & Washing Plants; Drlg. Machine (Cable Core or Rotary); Mixer, Concrete (1 CY & Less); Pump (6 " intake or over); Winch Truck; Hoist (1 Drum); Industrial Locomotive Motorman; Lumber Stacker; Tractor (50 Drawbar HP or over).

GROUP VI:

Concrete Paver Mixer; Hoist (2 drums & over); Side Boom; Traveling Crane; Piledriver; Backhoe, Clamshell, Dragline, Gradall, Shovel (3/4 CY to 3 CY); Cranes (Crawler or Mobile) 20 Ton to 40 Tons; Front End Loader (Over 10 CY); Mixer; Concrete (over 1 CY); Mechanic and/or Welder.

EQUIPMENT OPERATOR CLASSIFICATION GROUPS

GROUP VII:

Concrete Slip-Form Paving Machine; Concrete Paving Finishing Machine; Concrete Paving Longitudinal Float; Gunite Machine; Refrigeration; Jumbo Form or Drilling; Stage; Slusher; Concrete Paving Spreader; Pumpcrete Machine; Grout Pump Operator.

GROUP VIII:

Mine Hoist; Bulldozer (Multiple Units); Scraper (Multiple Units); Mucking Machine; Backhoe, Clamshell, Dragline, Gradall, Shovel (over 3 CY); Cranes (Crawler or Mobile) over 40 tons.

GROUP IX:

Belt Loader (CMI Type) Operator; Pipemobile Operator Assistant; Derrick, Cableway.

EQUIPMENT OPERATOR CONT'D.
PAGE 3

GROUP X:

Pipemobile Operator; Mole Operator.

TRUCK DRIVER CLASSIFICATION GROUPS

GROUP I:

Pick-up truck ¾ ton or under; Warehouseman; Dump Truck (under 8 cubic yards); Flatbed (1 ½ ton or under).

GROUP II:

Dump truck (8 – 16 cy); Tank Truck (under 6,000 gals.); Flatbed (over 1 ½ ton).

GROUP III:

Spreader Box (self-propelled); Distributor (asphalt); Transit Mix; Lowboy, Light Equipment; Off-Highway Hauler; Tank Truck (over 6,000 gals.); Dump Truck (over 16 cy); Trailer Semi-Trailer Dump.

GROUP IV:

Diesel-powered Transport; Lowboy; Heavy Equipment.

"A" - Street, Highway, Utility or Light Engineering
January 4, 2000

Survey Code	Trade Classification	Base Rate per hour	Fringe Rate per hour
93	Bricklayer,Blocklayer, Stonemason	9.13	0.26
52	Carpenter/Lather	11.40	0.44
53	Cement Mason	10.98	0.26
54	Ironworker	11.00	2.97
56	Painter (Brush/Roller or spray)	13.13	0.44
	Electricians		
n/a	Groundman (Outside)	15.29	4.75
n/a	Equipment Operator (O/S)	18.11	4.75
51	Lineman/Wireman or Tech (Outside)	18.57	4.72
n/a	Cable Splicer	19.88	4.75
94	Plumber / Pipefitter	19.02	3.90
	Operators		
n/a	Group I	11.56	0.26
n/a	Group II	11.76	0.26
n/a	Group III	12.34	0.26
58	Group IV	12.36	0.26
n/a	Group V	12.36	0.26
n/a	Group VI	12.51	0.26
n/a	Group VII	12.56	0.26
n/a	Group VIII	12.78	0.26
n/a	Group IX	13.21	0.26
n/a	Group X	14.01	0.26
	Laborers		
n/a	Group I	8.61	0.35
59	Group II	8.84	0.35
n/a	Group III	9.24	0.35
	Truck Drivers		
n/a	Group I	9.97	0.26
60	Group II	10.17	0.26
n/a	Group III	10.37	0.26
n/a	Group IV	10.57	0.26

Note: Subsistence and Incentive do not apply on "A" rates as per Rules & Regulations.

LABORER CLASSIFICATION GROUPS
TYPE "B" & "C" CONSTRUCTION
PAGE 1

GROUP I:

Watchmen.

GROUP II – (Unskilled):

Building & Common Laborers; Carpenter Tenders; Concrete Workers; Stakedrivers; Concrete Buggy Operator (hand); Flagmen; Soil Sample Tester.

GROUP III – (Semi-skilled):

Air & Power Tool Operator (not a carpenter's tool); Asbestos Remover; Asphalt Heaterman; Asphalt Jointman; Ashp. Raker; Batching Plant Scaleman; Chain Sawman; Concrete Touch-Up Man; Concrete Sawman – Coring Machine; Curbing Machine Asph. Or Cement; Cutting Torchman; Metal Form Setter-Road; Grade Setter; Gunite Reboundmen; Rod & Chainmen; Concrete Power Buggy Operator; Powderman or Blaster Helper; Sandblaster (Pot Men); Nozzlemen; Scaler; Vibratorman (hand-type); Vibratory Compactor (hand-type); Wagon Core & Diamond Drillers' Tenders (outside); Window Washers; Fog Machine Operator; Nurseryman-Gardener; Multi-Plate Setter; Concrete Burner; Cement Mason Tenders; Hodcarriers; Mortar Mixers; Plaster Spreader Operator; Plaster Tenders; Gunite Nozzleman; Pipelayer; Pumpcrete Nozzleman; Manhole Builder; Roadway Hardware Worker.

GROUP IV:

Wagon, Core, Diamond Drillers.

GROUP V - (Miscellaneous):

Landscaper; Traffic Control Technician; Laboratory Technician

GROUP VI:

Powderman and Blasters.

EQUIPMENT OPERATOR CLASSIFICATION GROUPS
PAGE 2

GROUP I:

Fireman; Oiler; Helpers; Mechanic, Welder, Grease Truck; Screedman; Scale Operator (such as Bin-a-Batch); Rubber Tire Farm-type Tractor; Tractors (under 50 HP w/o attachments); Brakeman; Concrete Paving Curing Machine (bridge-type).

GROUP II:

Rollers; Sheepsfoot or Pneumatic Self-Propelled w/o dozer; Concrete Conveyor; Service Truck Operator (head oiler); Air Compressor (300 CFM & over); Pumps (6" & over); Screening Plants; Concrete Mixers (under 1 cy); Concrete Saw or Grinder-Span Type; Hoists (1 drum); Air Tugger; Elevating Belt-type Loaders; Fork-lift Lumber Stacker; Tractor-Farm type (under 50 HP w/attachments); Motorman & Industrial Locomotive Operator; Winch Trucks; Front End Loader (under 2 cy); Power Plants which generate over 15 KW; Welding Machines.

GROUP III:

Bituminous Distributors; Boilers, Retort & Hot Oil Heaters; Concrete Mixers (1 cy & over); Concrete Paver (single drum); Drilling Equipment; Motor Graders (rough); Shaft & Tunnel Equipment; Refrigeration, Slusher, Jumbo Form; Trenching Machine (all types); Pumpcrete & Gunite Machine; Slipform Paver; Mechanic Bull-floats; Concrete Slab Spreading Machine; Concrete Slab Finish Machine; Asphalt Plants; Bitum. Finish Machine; Crushing Plants.

GROUP IV:

Front End Loader (2 – 10 cy); Rollers Steel Wheeled (all types); Bulldozers; Scrapers (motor or towed); Elevating Graders; Concrete Batching Plants; Self-propelled Rollers, (equipped w/ dozer); Twin-Bowl Scrapers & Quad 8 or 9 Pushers; Three Bowl Scrapers; Tractor (farm-type) w/hydraulic Backhoes.

GROUP V:

Concrete Paver (double drum); Cat Cranes; Hysters; Side & Swingboom Cats; Hoist (2 drum); Auto Fine Grader.

GROUP VI:

Mucking Machine (all types); Motor Grader-Finish.

EQUIPMENT OPERATOR CLASSIFICATION GROUPS
PAGE 3

GROUP VII:

Hydraulic Cranes (with less than 50' of boom – 20 tons & under); Steam Engineers; Loader (Front-end & over 10 cy); Concrete Pump (snorkel type); Mechanic Welder.

GROUP VIII:

All Shovel Type Equip.; Cranes; Draglines; Backhoes; Derricks; Guy & Stiff Leg; Pipemobile (#2 Oper.); Piledriver; Hydraulic Cranes (20 tons & over); Mine Hoist (belt loader CMI type); Cranes, Draglines (w/ booms & jib over 150'); Shovel (wheel type); Boring Machine (tunnel or shaft mmole); Pipemobile.

TRUCK DRIVER CLASSIFICATION GROUPS

GROUP I:

Pick-up ¾ ton & under; Service Station; Lubrication; Light Tire Repair or Washer; Swamper or Riding Helper; Teamster 2 or 4 up; Ambulance Driver.

GROUP II:

Bus or Taxi Driver; Dump or Batch Truck (under 8 cy WLC); Flatbed (bobtail) 2 ton & under; Mechanic & Welder Helper; Forklift (under 5 ton MRC).

GROUP III:

Dump Trucks (includes all highway & off-highway, 8 – 16 cy WLC); Water, Fuel or Oil Trucks (less than 3,000 gals.); Flatbed (bobtail) over 2 tons.

GROUP IV:

Distributor Driver; Heavy Tire Repair; Lumber Carrier Driver; Young Buggy or Similar Equipment; Transit Mix or Agitator 2 or 3 Axle Bobtail Equipment; Scissor Truck; Bulk Cement Bobtail 2 or 3 Axles; Semi-Trailer Driver (flatbed or van single axle); Forklift (5 ton & over MRC); Field Equipment Serviceman.

GROUP V:

Dumpster & Dumpcrete Driver; Water, Fuel or Oil Truck (3,000 – 6,000 gals.); Lowboy, Light Equipment Driver; Euclid-type Tank Wagon (under 6,000 gals.).

TRUCK DRIVERS CONT'D
PAGE 4

GROUP VI:

Vacuum Truck; Dump Trucks (including all hwy. & off-hwy., 16 – 22 cy WLC).

GROUP VII:

Transit Mix or Agitator Semi or 4 Axle Equipment Driver; Flaherty Truck-type Spreader Box Driver; Slurry Truck Driver; Bulk Cement Driver; Semi-Doubles; 4 Axle Bobtail; Winch Truck & "A" Frame; Dump Trucks (including all hwy. & off-hwy., 22 cy to 35 cy WLC); Head Field Equipment Serviceman.

TRUCK DRIVER CLASSIFICATION GROUPS

GROUP VIII:

Euclid Diesel Powered Turnarocker; Terra Cobra; DW 10; DW 20; Letourneau Pulls & Similar Diesel Powered Equipment; Lowboy Heavy Equip. Driver; Water, Fuel or Oil Trucks (6,000 gals. & over including Tank Wagon Drivers); Semi-Trailer Driver (flatbed or van tandems); Light Equipment Mechanic; Dump Trucks (including hwy. & off-hwy.) 35 cy WLC & over; Truck & Trailer or Semi-Trailer (flatbed); Eject All Driver.

GROUP IX:

Lowboy (heavy equip., double gooseneck); Heavy Equip. Mechanic; Welder (Body & Fender Man); Warehouseman; Material Checker-Cardexman; Expeditor.

"B" GENERAL BUILDING January 4, 2000

Trade Classification	Base Rate	Fringe Rate	Apprent. Contr. Rate
Asbestos Workers/Heat & Frost Insulator	17.33	4.75	$0.17
Boilermaker	17.18	3.18	$0.20
Bricklayer,Blocklayer,Stonemason	18.99	2.97	$0.30
Carpenter/Lather	17.65	2.99	$0.20
Cement Mason	14.77	2.42	$0.20
Electricians			
Groundman (Outside)	15.84	4.96	$0.19
Equipment Operator (Outside)	18.66	4.96	$0.19
Lineman/Technician(Outside)	19.25	4.96	$0.19
Cable Splicer (Outside)	20.43	4.96	$0.19
Wireman or Technician (Inside)	20.03	5.14	$0.19
Cable Splicer (Inside)	21.74	5.14	$0.19
Installer (Sound)	9.88	1.76	$0.00
Technician (Sound)	11.43	1.76	$0.00
Soundman (Sound)	13.50	1.76	$0.00
Elevator Constructor	20.22	6.03	$0.80
Elevator Constructor Helper	14.16	6.04	$0.90
Glazier	14.06	3.78	$0.30
Ironworker	15.75	5.93	$0.38
Painter (Brush/Roller or Spray)	12.48	1.79	$0.00
Drywall Finisher or Taper	15.25	2.28	$0.10
Plasterer	15.85	2.62	$0.20
Plumber/Pipefitter	21.88	5.24	$0.31
Roofer	6.79	0.50	$0.00
Sheet Metal Worker	20.66	6.38	$0.47
Soft Floor Layer (carpet, asphalt tile or linoleum)	15.23	2.73	$0.00
Sprinkler Fitter	19.31	3.35	$0.11
Tile Setter	14.30	1.02	$0.00
Tile Setter Helper	13.00	1.02	$0.00

Operators	Group I	16.37	2.45	$0.30
	Group II	17.41	2.45	$0.30
	Group III	17.49	2.45	$0.30
	Group IV	17.55	2.45	$0.30
	Group V	17.61	2.45	$0.30
	Group VI	17.71	2.45	$0.30
	Group VII	17.81	2.45	$0.30
	Group VIII	18.69	2.45	$0.30
Laborers	Group I	9.34	2.21	$0.00
	Group II	10.21	2.21	$0.00
	Group III	10.51	2.21	$0.00
	Group IV	10.61	2.21	$0.00
	Group V	10.81	2.21	$0.00
	Group VI	10.98	2.21	$0.00
Truck Drivers	Group I	13.49	1.97	$0.00
	Group II	13.61	1.97	$0.00
	Group III	13.69	1.97	$0.00
	Group IV	13.81	1.97	$0.00
	Group V	13.86	1.97	$0.00
	Group VI	13.96	1.97	$0.00
	Group VII	14.06	1.97	$0.00
	Group VIII	14.20	1.97	$0.00
	Group IX	14.35	1.97	$0.00

SUBSISTENCE & INCENTIVE RATE APPLY ONLY IF EMPLOYEE LIVES 60 OR MORE MILES FROM JOB SITE.

Trade Classification	Incentive Rate	Susbsistence Rate	Location
Carpenter/Lather	$0.00	$2.50	Espanola & Rio Rancho
Carpenter/Lather	$0.00	$1.25	Moriarty
Cement Mason	$0.00	$2.00	Los Alamos
Cement Mason	$0.00	$2.50	Rio Rancho
Common worker	$0.00	$2.50	BE Co. Espanola, LA Co., Las Cruces
Painter (Brush/Roller or Spray)	$1.37	$0.00	Albuquerque
Plaster	$1.50	$1.50	Grants
Plumber/Pipefitter	$0.00	$0.80	Los Alamos
Sheet Metal Worker	$2.00	$0.00	Los Alamos
Soft Floor Layer	$1.00	$0.00	Espanola

LABOR CLASSIFICATION GROUPS
TYPE "H" CONSTRUCTION

GROUP I – (Unskilled):

Building and Common Laborer; Carpenter Tender; Chainman; Rodman; Stakedriver; Concrete Buggy Operator (Hand); Concrete Workers; Flagmen; Soil-Sampler Tester.

GROUP II – (Semi-skilled):

Wagon, Air-Tract; Drill & Diamond Drillers' Tender (outside); Air & Power Tool Operator (not a carpenter's tool); Asbestors Remover; Asphalt Heaterman; Asphalt Jointman; Asphalt Raker; Batching Plant Scaleman; Tenderers (to Cement Mason & Plasterer); Chain Sawman; Concrete Power Buggyman Operator; Concrete Touch-Up Man; Concrete Sawman – coring machine; Curbing Machinist, Asph. Or Cement; Cutting Torchman; Metal Form Setter-Road; Grade Setter; Hod Carrier; Mortar Mixer & Mason Tender; Powderman or Blaster Helper; Sandblaster; Scaler; Vibratorman (hand-type); Vibratory Compactor (hand-type); Window Washer; Nurseryman-Gardener; Wagon, Air Tract, Drill & Diamond Driller (outside); Roadway Hardware Worker.

GROUP III – (Miscellaneous):

Gunite Pumpcrete Man & Nozzleman; Multi-plate Setter; Manhole Builder; Pipelayer; Powderman-Blaster-Make-Up; Landscaper; Traffic Control Technician; Laboratory Technician.

GROUP IV – (Shaft Workers):

Air Tugger Operator; Concrete Workers (incl. All cement chipping & finish, underground); Drillers; Form Setters & Handlers; Hand Muckers; Miners; Powdermen; Timbermen (wood or steel); Reinforcing Steel Setters; Tunnel Liner; Plate Setters, all Cutting & Welding Incidental to Miner's Work; Toplanders; Bottomlanders.

GROUP V – (Shaft Workers):

Shifters.

GROUP VI – (Tunnel Workers):

Laborers and Handmuckers.

GROUP VII – (Tunnel Workers):

Chuck Tenders; Groutmen; Nippers; Trackmen.

LABOR CLASSIFICATION GROUPS
TYPE "H" CONSTRUCTION (CONT'D)

GROUP VIII – (Tunnel Workers):

Drillers; Form Setters & Handlers; Scalers; Miners; Timbermen; Brakemen; Concrete Workers (incl. All cement chipping & finishing underground); Reinforcing Steel Setters; Timbermen (wood or steel); Tunnel Liner Plate Setters; All Cutting & Welding Incidental to Miner's Work.

GROUP IX – (Tunnel Workers):

Powdermen.

GROUP X - (Tunnel Workers):

Shifters.

EQUIPMENT OPERATOR CLASSIFICATION GROUPS
TYPE "H" CONSTRUCTION

GROUP I:

Concrete Paving Curing Machine.

GROUP II:

Belt Type Conveyors (material & concrete); Broom (self-propelled); Forklift; Greases Truck Oper.; Head Oiler; Hydro Lift; Tractor (under 50 drawbar HP with or without attach.); Industrial Loco. Brakeman; Front-End Loader (2 cy or less); Fireman; Oiler; Screedman; Roller (pull-type); Mulching Machine; Roller (self-propelled).

GROUP III:

Concrete Paving Form Grader; Concrete Paving Gang Vibrator; Concrete Paving Joint or Saw Machine; Concrete Paving Sub Grader; Tractor with Backhoe Attachment; Subgrade or Base Finisher; Power Plant (electric generator or welding machine).

GROUP IV:

Bulldozer (including self-propelled roller with dozer attachment); Batch or Continuous Mix Plant (concrete, soil-cement, or asph.); Roller (steel wheel); Front End Loader (2 – 10 cy); Scraper Operator; Motor Grader.

GROUP V:

Asphalt Distributor; Paving or Laydown Machine; Asphalt Retort Heater; Mixer, Heavy Duty, Asphalt or Soil Cement; Trenching Machine; Clam Type Shaftmucker; Backhoe, Clamshell, Dragline, Gradall, Shovel (under ¾ cy); Elevating Grader or Belt Loader; Cranes (crawler or mobile) under 20 tons; Air Compressor (300 CFM & over); Crushing Screening & Washing Plants; Drilling Machine (cable core or rotary); Mixer, Concrete (1 cy & less); Pump (6 " intake or over); Winch Truck; Hoist (1 drum); Industrial Locomotive Motorman; Lumber Stacker; Tractor (50 drawbar HP or over).

GROUP VI:

Concrete Paver Mixer; Hoist (2 drums & over); Side Boom; Traveling Crane; Piledriver; Backhoe, Clamshell, Dragline, Gradall, Shovel (3/4 cy to 3 cy); Cranes (crawler or mobile) 20 – 40 ton; Front End Loader (over 10 cy); Mixer; Concrete (over 1 cy); Mechanic and/or Welder.

EQUIPMENT OPERATOR CLASSIFICATION GROUPS
TYPE "H" CONSTRUCTION (CONT'D)

GROUP VII:

Concrete Slip-Form Paving Machine; Concrete Paving Finishing Machine; concrete Paving Longitudinal Float; Gunite Machine; Refrigeration; Jumbo Form or Drilling; Stage; Slusher; Concrete Paving Spreader; Pumpcrete Machine; Grout Pump Operator.

GROUP VIII:

Mine Hoist; Bulldozer (multiple units); Scraper (multiple units); Mucking Machine; Backhoe, Clamshell, Dragline, Gradall, Shovel (over 3 cy); Cranes (crawler or mobile) over 40 tons.

GROUP IX:

Belt Loader (CMI type) Operator; Pipemobile Operator Assistant; Derrick, Cableway.

GROUP X:

Pipemobile Operator; Mole Operator.

TRUCK DRIVER CLASSIFICATION GROUPS
TYPE "H" CONSTRUCTION

GROUP I:

Pick-up Truck (¾ ton or under); Warehouseman; Dump Truck (under 8 cy); Flatbed (1 ½ ton or under).

GROUP II:

Dump Truck (8-16 cy); Tank Truck (under 6,000 gals.); Flatbed (over 1 ½ ton).

GROUP III:

Spreader Box (self-propelled); Distributor (asphalt) Transit Mix; Lowboy; Light Equipment; Off-Highway Hauler; Tank Truck (over 6,000 gals.); Dump Truck (over 16 cy); Trailer Semi-Trailer Dump.

GROUP IV:

Diesel-powered Transport; Lowboy; Heavy Equipment.

"H"-Heavy Engineering

January 4, 2000

Survey Code	Trade Classification	Base Rate per hour	Fringe Rate per hour	Apprenticeship Contribution Rate
35	AsbestosWorker/Heat&Frost Insulator	19.30	4.75	0.17
36	Boilermaker	21.08	6.96	0.36
37	Bricklayer,Blocklayer,Stone Mason (No '98 or '99 hours)	No Rate		
38	Carpenter/Lather	17.65	3.24	0.20
39	Millwright/Piledriver	18.80	2.99	0.20
40	Cement Mason	12.35	1.67	0.00
	Electricians			
	Outside Classifications:			
n/a	Groundman (Outside)	18.99	6.12	0.20
n/a	Equipment Operator (O/S)	21.81	6.12	0.20
42	Lineman or Technician (Outside)	22.40	6.12	0.20
n/a	Cable Splicer (Outside)	23.58	6.12	0.20
	Inside Classifications:			
33	Wireman/Tech (Inside)	19.60	5.50	0.20
n/a	Cable Splicer (Inside)	21.33	5.50	0.20
95	Glazier (No'97,'98,'99 hours)	No Rate		
43	Ironworker	16.34	5.93	0.38
44	Painter(Brush/Roller/Spray)	11.25	1.25	0.00
46	Plumber/Pipefitter	21.88	5.24	0.31
34	Roofer	14.55	4.78	0.23
47	Sheet Metal Worker	19.99	5.55	0.47
	Operators			
n/a	Group I	15.25	2.50	0.30
n/a	Group II	15.45	2.50	0.30
n/a	Group III	16.03	2.50	0.30
48	Group IV	16.05	2.50	0.30
n/a	Group V	16.05	2.50	0.30
n/a	Group VI	16.20	2.50	0.30
n/a	Group VII	16.25	2.50	0.30
n/a	Group VIII	16.40	2.50	0.30
n/a	Group IX	16.90	2.50	0.30
	Group X	17.70	2.50	0.30

"H"-Heavy Engineering
January 4, 2000

	Laborers			
n/a	Group I	9.39	1.20	0.06
49	Group II	9.69	1.20	0.06
n/a	Group III	9.99	1.20	0.06
n/a	Group IV	10.56	1.20	0.06
n/a	Group V	10.81	1.20	0.06
n/a	Group VI	9.54	1.20	0.06
n/a	Group VII	9.69	1.20	0.06
n/a	Group VIII	9.94	1.20	0.06
n/a	Group IX	10.14	1.20	0.06
n/a	Group X	10.81	1.20	0.06
	Truck Drivers			
n/a	Group I	9.60	0.45	$0.00
50	Group II	9.80	0.45	$0.00
n/a	Group III	10.00	0.45	$0.00
n/a	Group IV	10.20	0.45	$0.00

Incentive and subsistance pay do not apply to "H" type construction.

SECTION 11

SPECIFICATIONS

LAKE MEREDITH SALINITY CONTROL PROJECT

SPECIFICATIONS

CIVIL/STRUCTURAL/ARCHITECTURAL

CIVIL/STRUCTURAL/ARCHITECTURAL

SECTION	TITLE
09511	Suspended Acoustical Ceilings
09650	Resilient Flooring
09900	Painting
10508	Metal Wardrobe Lockers
10800	Toilet and Bath Accessories
11100	Potable Water Supply
11200	Brine Storage Tanks and Containment Structure
12512	Horizontal Louver Blinds
15064	Discharge Line

PART 1 GENERAL

1.1 DESCRIPTION

A. Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the project site, for the establishment of all offices, buildings and other facilities necessary for work on the project; for furnishing, erection and maintenance of construction signs and for all other work and operations which must be performed, or costs incurred, not otherwise paid for prior to beginning work on the various items on the project site.

PART 2 EXECUTION

2.1 FIELD OFFICE

A. Locate field offices as shown on Drawings.

PART 3 PAYMENT

3.1 PAYMENT

A. Payment for this work will be made at the lump sum price bid in the schedule. three payments will be made in accordance with the following schedule:
   1. When 5% of the original contract amount is earned, 40% of the amount bid for mobilization will be paid.
   2. When 10% of the original contract amount is earned, 40$ of the amount bid for mobilization will be paid.
   3. When 80% of the original contract amount is earned, 100% of the amount bid for mobilization will be paid.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of clearing, grubbing, and removing and disposing of trees, vegetation, and debris.

PART 2 PRODUCTS

2.1 TREE PAINT

A. Approved asphalt base paint prepared especially for tree surgery.

2.2 BACKFILL MATERIAL

A. Suitable material obtained from on-site excavation as specified in Section 02210.

PART 3 EXECUTION

3.1 PROTECTION OF TREES AND PLANTS TO REMAIN

A. Section 01010.

3.2 CLEARING

A. Remove all trees, brush, and vegetation from areas designated to be cleared. As directed, trim low hanging, unsound, or unsightly branches on trees and shrubs designated to remain. Make cuts flush with trunk or branch. Fill stump and root holes.

3.3 GRUBBING

A. Remove all stumps, and debris a minimum of 12 inches below original ground. Use hand methods for grubbing inside drip line of trees to remain. Fill stump and root holes.

3.4 SALVAGE

A. Cut trees and branches 3 inches in diameter and larger into 2-foot log lengths and stockpile where directed by Contracting Officer.

3.5 DISPOSAL

A. Cleaning: Remove excess materials, debris, and equipment in accordance with General and Supplementary Conditions. Keep public or private ways, access roadways, streets and driveways used as access or egress to or from project site free from materials falling from trucks. Promptly clean streets, roadways, etc. to the satisfaction of the Owner and public or private Authorities having jurisdiction. A wheel wash area is to be used for removal of debris from vehicles, prior to leaving the site.

B. Excess Materials: Arrange for disposition of unsuitable materials, waste materials, and materials not allowed by specifications for fill, backfill, or site grading in accordance with local requirements. Location of dump, length of haul, and disposal expenses are Contractor's responsibility.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of designing, constructing, maintaining, and removing temporary diversion and water quality works necessary to construct pumps, discharge lines, vaults, outlet work and ancillary works. The Canadian River is regulated by Ute Dam and Reservoir located immediately upstream of the project. All work shall be coordinated with the Interstate Stream Commission and the Canadian River Municipal Water Authority.

B. Any damage sustained by floods, releases from Ute Dam and Reservoir or inadequate protection shall be repaired by and at the expense of the Contractor.

1.2 RELATED WORK

A. Discharge line - Section 15064.

B. Utility Trenching and Backfill - Section 02221.

C. Vaults and Manholes - Section 02605.

1.3 QUALITY ASSURANCE

A. Meet all U.S. Army Corps of Engineers 404 permit requirements.

PART 2 EXECUTION

1.1 SURVEY: Survey area where diversion works will be constructed and prepare contour map at 1"=20 foot with 1-foot contour, interval. Locate and define work to be performed on base map and submit to Contracting Officer.

1.2 Construct diversion works to not interrupt flow in Canadian River or cause severe water quality degradation.

1.3 Remove and cleanup all material placed by Contractor and grade to existing contours.

PART 3 PAYMENT

3.1 PAYMENT

A. Payment for diversions and care of river will be made at the lump sum price bid in the schedule. The price will include the cost of furnishing all labor, material and equipment for designing, surveying, constructing, maintaining and removing diversion, protection, and care of river work.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of designing, furnishing and installing structural shoring at excavations and elsewhere as required to protect workmen, materials, properties, structures, utilities and the public during construction.

B. Related Work:
1. Section 02225: Structure Excavation and Backfill.

1.2 QUALITY ASSURANCE

A. Employ a qualified Civil Engineer, registered in the State of New Mexico, to design the shoring system and to inspect and report on the quality of its construction.

B. Coordinate the shoring design and construction with:
1. Structural system established for the Work, including location of roadway, utilities and other features.

C. Conduct geotechnical investigations required to design and construct shoring system.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Coordinate and schedule work to preclude interference with other operation.

C. Submit the shoring design to Contracting Officer for review. Should changes in the shoring design be required subsequent to the Contracting Officer's review. Contractor shall modify the design to satisfy the requirements.

D. Upon completion of construction of this portion of the Work, submit to the Contracting Officer two copies of a letter signed by the registered Civil Engineer stating that the shoring system was constructed in accordance with the approved design.

PART 2 PRODUCTS

2.1 DESIGN

A. Design a shoring system which will safely and adequately prevent collapse of adjacent structure, material, utilities and property, and which will permit construction of the Work to the arrangement shown on the Drawings.

2.2 MATERIALS

A. Furnish all the materials required for execution and installation of the approved shoring system.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Verify the locations of existing utilities and structures to be shored including footing depths and dimensions. Correct conditions detrimental to the timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Construct and install the shoring system in strict accordance with the approved design, reviewed by the Contracting Officer.

B. After construction is completed, the Contractor may begin to remove the shoring. Backfill and plug areas left by the shoring system with a lean concrete conforming to Class E concrete of New Mexico Department of Highways Standard Specification for Roads and Bridges, 1991, Section 503.012. Contractor may leave the shoring system buried if its removal becomes impractical upon approval of Contracting Officer.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of site excavation and grading.

1.2 RELATED WORK

A. Structure Excavation and Backfilling - Section 02225.

B. Structural Concrete - Section 03301.

C. Roadway Construction - Section 02231.

1.3 QUALITY ASSURANCE

A. Density Testing: Required to determine compliance for the work of this section shall be the responsibility of the Contractor at no additional expense to the Government. Perform one test per 8" lift per 2,500 square feet of filled area.

B. Submittals: As specified in Section 01300, submit independent laboratory test data for imported borrow materials and density testing to the Contracting Officer for approval.

1.4 CLASSIFICATION

A. All excavation under this section will be considered unclassified regardless of the nature of material encountered.

1.5 PROJECT CONDITIONS

A. Maintain fills, slopes, and ditches within the limits of the new construction until final acceptance. Repair damaged areas at no additional expense to the Government.

PART 2 PRODUCTS

2.1 IMPORTED BORROW

A. Clean, readily compactible soil or soil aggregate, with all particles passing a 3-inch square

opening and not more than 35 percent by weight passing a No. 200 sieve, as determined by AASHTO T88-93. The portion of material passing the No. 40 sieve shall have a plasticity index of not more than 10, as determined by AASHTO T90-93. Use all suitable existing excavation material before importing borrow.

2.2 WATER: Section 02233.

2.3 ROADWAY MATERIAL: Roadway Construction - Section 02231.

2.4 GRAVEL SURFACING:

2.5 HERBICIDE:

2.6 CHAIN LINK FENCE: AASHTO M181, zinc coating to conform with ASTM A392.

2.7 CHAIN LINK GATE: 16' double swing chain link gate with locking drop rod conforming to NMHD Standard Specifications for Road and Bridge Construction, Section 607.

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING: Section 02110.

3.2 STRIPPING AND STOCKPILING TOPSOIL:

A. Strip topsoil within the construction limits to a depth of 6 inches. The Contracting Officer will designate locations for stockpiles.

3.3 EXCAVATION

A. Excavate to lines and grades shown. Keep excavation free from water during construction. As directed, stockpile excavated material to be used in embankment construction. Excavate rock to a minimum depth of 6 inches and a maximum depth of 12 inches below subgrade.

B. Auger foundation for fence post foundation. Clean and remove loose material prior to concreting.

3.4 DENSITY REQUIREMENT

A. Compact the top 2.5 feet of embankments supporting walks and other structures to 95 percent of the maximum density as determined by AASHTO T-99-93 or T180-93, Method D, at plus or minus 2 percent of the optimum moisture content. Compact embankments

below the top 2.5 feet and embankments not supporting walks or other structures to 90 percent of maximum density as determined by AASHTO T99-93 or T180-86, Method D, at plus or minus 2 percent of the optimum moisture content. Density testing of compacted material shall be made in accordance with AASHTO T191-93, T205-93, or other standard accepted field density testing methods.

3.5 SUBGRADE TOLERANCE

A. The finish subgrade elevation shall not vary above or below the theoretical grade more than 0.1 foot.

3.6 FENCE POST FOUNDATION: Completely fill auger hole with concrete. Consolidate by rodding concrete. Top of concrete will be convex shaped with 2" above finished grade at post perimeter.

3.7 DISPOSAL

A. Disposal of all surplus and unsuitable material as specified in Section 01560.

3.8 ROADWAY - Section 02231.

3.9 GRAVEL SURFACING

A. Apply approved herbicide to sterilize area receiving gravel surfacing in concentration and dosage recommended by manufacturer.

B. Place and roll gravel surfacing material to thickness shown on the drawings using vibratory rollers. Hand vibrate within 3 feet of structures.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of trenching and backfilling for the construction and installation of pipelines, conduits and cables. All trenching will be open cut.

1.2 DEFINITION: Materials used in backfill, as shown in trench details, are defined as follows:

A. Bedding (BD): Materials shall be predominantly sand and gravel, having a plasticity index less than 6. Bedding may be omitted if, in the opinion of the Contracting Officer, the excavated trench bottom will adequately support and not damage the utility line.

1. BD-1: Gradation as follows:

Sieve Size	Percent Passing
No. 4	100
No. 8	55 - 85
No. 40	15 - 30

2. BD-2: Gradation as follows:

Sieve Size	Percent Passing
½-inch	100
No. 4	50 - 80
No. 40	10 - 25

3. BD-3: Gradation as follows:

Sieve Size	Percent Passing
1-1/2-inch	100
½-inch	45 - 75
No. 40	10 - 25

B. Select Backfill (SB): Materials shall be predominantly sand and gravel, having a plasticity index less than 6.

1. SB-1: Gradation as follows:

Sieve Size	Percent Passing
No. 4	100
No. 8	55 - 85
No. 40	10 - 30

2. SB-2: Gradation as follows:

Sieve Size	Percent Passing
½-inch	100
No. 4	50 - 80
No. 40	10 - 25

3. SB-3: Gradation as follows:

Sieve Size	Percent Passing
3/4-inch	100
3/8-inch	55 - 85
No. 40	10 - 25

4. SB-4: Gradation as follows:

Sieve Size	Percent Passing
1-1/2-inch	100
½-inch	45 - 75
No. 40	10 - 25

5. BD-1, 2 and SB-1, 2 will be applied on subgrade consisting of silts and fine sands; BD-3, SB-3 and SB-4 on subgrade consisting of rock and gravels.

C. Backfill (BF):
   1. Materials shall be site generated material free of organic and deleterious material having a plasticity index less than 6.

D. Concrete Backfill: Concrete shall conform to strength and material requirement of Class E concrete of New Mexico Department of Highway Standard Specifications for Roads and Bridges, 1991, Section 503.012.

1.3 QUALITY ASSURANCE

A. All compaction testing and gradation analysis shall be arranged and paid for by the Contractor.

B. All references to percent of maximum density shall be as determined by ASTM D1557-91, at a moisture content determined to be suitable for such density. Moisture-density curves shall be prepared in a certified soils testing laboratory.

C. In-Place Soil Density Testing: Procedures used by the Contractor shall be in accordance with ASTM D1556-90, Density of Soil In place by the Sand-Cone Method, or ASTM D-2922-91, Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth). The Contractor shall perform at least one test within each backfill material zone (BD, SB, BF) at the following maximum intervals:
   1. Vehicular Traffic Area: 50 linear feet of trench.
   2. Nontraffic Areas: 200 linear feet of trench.
   3. Testing at more frequent intervals may be performed at the discretion of the Contracting Officer.

1.4 SUBMITTALS: As specified in Section 01300.

A. Written procedure for trench dewatering and disposal of fluidized materials removed.

B. Written description of barricading, shoring, cribbing, bracing, and sloping precautions.

1.5 PROJECT CONDITIONS

A. Obtain all required permits and licenses before installing utilities under existing roads, and follow the rules and requirements of the authority having jurisdiction.

B. Arrange construction sequences to provide the shortest practical time that the trenches will be open to avoid hazard to the public, and to minimize the possibility of trench collapse.

1.6 EXCAVATION CLASSIFICATION: Regardless of the nature of material excavated, all excavation will be considered unclassified.

1.7 HAND EXCAVATION: Contracting Officer will direct the performance of hand excavation within the drip line of selected trees.

PART 2 PRODUCTS

2.1 GENERAL: All backfill material shall be approved before use and be free of cinders, ashes, ice, frozen soil, large hard clods, organic debris, or other deleterious items. Trench excavation materials may be used as approved.

2.2 MATERIALS FOR BACKFILLING: Furnish required bedding, select backfill, and backfill materials listed under the appropriate types of utility line in the sections to which this work relates.

2.3 UTILITY LINE MARKING: All utilities shall be marked for location and identified by marking tapes, as specified in Section 02229.

PART 3 EXECUTION

3.1 EXCAVATION FOR APPURTENANCES

A. Excavate for appurtenant piping structures to provide at least 12 inches (minimum) clear distance between outer surface and embankment.

B. See Section 02225 for applicable requirements of excavation, filling and backfilling.

C. See Sections 02605 and 02225 for requirements regarding manholes or similar structures.

3.2 TRENCH EXCAVATION

A. Trench Guidelines: Excavate the trench to the approximate level of the top of the utility line to be installed, using adequate trench width and side slopes to safely accommodate worker access. Continue excavating for the utility line, to a width not greater than is shown on the appropriate trench detail.
   1. Rocky Trench Bottom: Where ledge rock, hard pan, boulders, or sharp-edged materials are encountered, overexcavate a minimum depth of 6 inches below the bottom of the utility exterior wall to permit adequate bedding preparation. The installed utility shall have at least 6 inches of clearance from any rock protrusion.

2. Unstable Trench Bottom: Secure approval of depth of over-excavation and stabilization method. For wet trench construction, use approved method of dewatering through diversion, damming and pumping, well points, or underdrain systems. Dispose of removed fluidized materials as approved. Use BD-3 materials to build a suitable foundation to within 6 inches of finished utility grade, prior to bedding with the specified materials. Compact layers to 95 percent of maximum density if not greater than 6-inch layers. Do not proceed with utility installation until wet trench and unstable conditions are under control.
3. Hand Excavation: Perform hand excavation of trenches dug within the drip line of selected trees as shown. Carefully excavate around all roots 2 inches in diameter and larger to ensure against damage.

B. Paved Areas: Cut existing pavement full depth to a true line before excavation, as shown, and maintain the edge suitable for repaving. Pavement removed shall not be used as backfill.

C. Excavate trenches by open cut method to depth necessary to accommodate work.

D. Open trench outside buildings, units, and structures shall be no more than the distance between two manholes, structures, units, or 600 lineal feet, whichever is greater. Trenching limitations may be field adjusted by Contracting Officer as weather conditions dictate. Trenching within buildings, units, or structures shall be limited to no more than 100 lineal feet at any one time.

E. Do not open greater length of trench than can be effectively utilized under existing conditions. Schedule work and order materials so that trenches are not left open for a longer period than is reasonably necessary. Any trench or portion of trench, which is opened and remains idle for two calendar days, or longer, as determined by the Contracting Officer, may be directed to be immediately refilled, without completion of work, at no additional cost to Government. Said trench may not be reopened until Contracting officer is satisfied that work associated with trench will be prosecuted with dispatch.

F. Observe the Following Trench Criteria:
1. Trench Size: Observe all applicable regulations regarding trenching safety. Excavate only sufficient width to accommodate free working space.
2. Where soil conditions permit, cut trench walls vertically from bottom of trench to 1 foot above top of the pipe, conduit, or utility service.
3. Keep trenches free of water. Dewater as necessary.
4. Brace and sheet trenches as soil conditions dictate and in full compliance with all requirements. Do not remove sheeting until backfilling has progressed to the stage that no damage to piping, utility service, or conduit will result due to removal.
5. Brace trenches running near existing structures, walls or columns, to prevent any settlement or other disturbance of walls or columns.

G. Trenching for Electrical Installations:
   1. Observe requirements of this article with following modifications for electrical installations.
      a. Do not open more than 600 lineal feet of trench in exterior locations for trenches more than 12 inches but nor more than 30 inches wide.
      b. Any length of trench may be opened in exterior locations for trenches which are 12" wide or less.
      c. Do not over excavate trench.
      d. Trenching depths for electrical work. See Section 16377 for additional requirements.

3.3 PREPARATION OF FOUNDATION FOR PIPE LAYING

A. If over-excavation occurs, backfill with bedding materials.

B. In case of rock excavation, carry excavation minimum of 6 inches below established grade and backfill to grade with suitable earth or granular material.

C. Remove unstable trench bottom caused by Contractor failure to dewater, rainfall, or Contractor operations. Replace with bedding materials.

3.4 SHORING AND SHEETING

A. Construct and maintain all shoring, sheeting, and slope lay-back necessary to protect the excavation, as needed for the safety of the employees and as required by applicable State and Federal laws.

B. For trenches over 5 feet deep, provide suitable barricades for worker protection. When work area is left open and unattended by Contractor, provide suitable barricades for public safety, regardless of trench depth.

C. For trenches over 4 feet deep, provide suitable exit means in accordance with applicable provisions of OSHA 29 CFS 1926-1993.

D. Do not remove timber or sheeting if it is in a compacted zone. Instead, trim it off at a safe level above that zone.

E. As directed, remove all other sheeting and shoring when safe to do so.

3.5 BACKFILLING

A. Do not backfill until tests to be performed on system show system is in full compliance to specified requirements.

B. Methods: Provide backfill and compaction methods of following types.

1. Bedding (pipe zone) material. Furnish compacted bedding where indicated on the drawings or specified up to 6 inches above top of pipe or conduit. Comply with the following:
   a. Place backfill in lifts not exceeding 8 inches (loose thickness).
   b. Hand place, shovel slice, and pneumatically tamp all bedding (pipe zone) material.
   c. Observe specific pipe of conduit manufacturer's recommendations regarding methods of backfilling and compaction.
   d. Ensure compaction of each lift to requirements stated in these specifications.
2. Compacted Backfill: Perform remaining backfill in accordance with the following:
   a. Place backfill in lift thicknesses capable of being compacted to densities specified.
   b. Observe specific pipe or conduit manufacturer's recommendations regarding method of backfilling and compaction.
   c Exercise extreme care in backfilling operation to avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion. Repair damages, distortions or misalignments to full satisfaction of Contracting Officer.
   d. Use vibratory compactors for sands and gravels (noncohesive soils). Use mechanical tampers for sand and gravel containing a significant portion of fine-grained material, such as silt and clay (cohesive soils). Hand tamp around pipe or cable to protect the lines until adequate cushion is attained. Puddling or water flooding for consolidation of backfill or compaction by wheel rolling with construction equipment will not be permitted.

C. Water flushing for consolidation will not be permitted except for consolidating sand in annular space between pipe and sleeve for the angle drilled discharge line.

D. Backfilling for Electrical Installations:
   1. Observe paragraph above entitled "Methods" with following modifications for electrical installation.
      a. Observe notes and details on electrical drawings for fill in immediate vicinity of direct burial cables.

E. Utility Installation: Shape the trench bottom to ensure uniform contact with the full length of the installed line and remove any sharp-edged materials that might damage the line. Compaction shall be maintained beneath the line.

F. Select Backfill: Fill by hand placement around the utility to just over half depth, and compact in a manner to ensure against lateral or vertical displacement. Place select backfill to 6 inches above the utility line by hand placement in not more than 6-inch layers.

G. Backfill: Place and compact the specified material as follows:
   1. Vehicular Traffic Areas: Fill and compact in 8-inch maximum layers to 95 percent of maximum density.

2. Nontraffic Areas: Fill and compact in 8-inch maximum layers to 90 percent of maximum density.

3.6 COMPACTION

A. Unless noted otherwise on drawings or specified by other sections of these specifications, comply with following trench compaction criteria.

LOCATION	BACKFILL TYPE	DENSITY
1. Bedding (BD) and selective backfill (SB) - all areas	Cohesive soils	95 percent of maximum dry density by ASTM A4253-91 and D4254-91
	Cohesionless soils	75 percent of relative density by ASTM D2049-91
2. (BF) Backfill: Under pavements, roadways surfaces, within highway right-of-ways	Cohesive soils	90 percent of maximum dry density by ASTM D1557-91
	Cohesionless soils	50 percent of relative density by ASTM D4253-91 and D4254-91
Under non-traffic areas	Cohesive soils	85 percent of maximum dry density by ASTM D1557-91
	Cohesionless soils	25 percent of relative density by ASTM D4253-91 and D4254-91
3. Concrete Backfill	Concrete	Consolidate by vibration of course aggregates and voids. Conform to ACI 304-73.

3.7 FIELD QUALITY CONTROL

A. Testing:
1. Secure a testing laboratory to perform in-place moisture density tests to ensure trench

backfill complies with specified requirements. Where backfill compaction does not meet moisture density test requirements and after backfill has been removed as directed by Contracting Officer and situation corrected, perform additional tests as directed until compaction meets or exceeds requirements at no additional expense to the Government.

3.8 SURFACE FINISH WORK

A. Paved Areas: Replace removed paving and base course with new material of equal or better quality and of the same texture and color as adjacent paved areas. Saw cut pavement edge to a true line and broom as needed prior to paving.

B. Open and Seeded Areas: Grade all disturbed areas to a finish ordinarily obtained from a blade grader, with no abrupt changes in grade or irregularities that will hold water.

C. Drainage Ditches: Restore drainage ditches to appropriate line and grade, using approved surface erosion prevention techniques.

D. Clean-Up: Prior to final inspection and acceptance, remove all rubbish and excess material for disposal as approved, and leave area in a neat, satisfactory condition.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of drilling a pilot hole, reaming to an 18 inch diameter angle hole, installing a carbon steel pipe sleeve with a minimum diameter of 10 inch, low pressure grouting, installing a 6 inch HDPE pipe, excavating and backfilling, placing concrete and other ancillary work.

1.2 RELATED WORK

A. Discharge line - Section 15064.

B. Structural Concrete - Section 03301.

C. Structure Excavation and Backfill - Section 02225.

1.3 QUALITY ASSURANCE

A. Contractor shall examine the site, perform exploration and testing at his expense prior to selecting equipment and method of operation to accomplish the work.

B. Contractor may submit alternative design prepared and sealed by a New Mexico professional engineer for approval.

C. Submit installation procedures for review.

D. Tolerances:
1. Top of drilled hole - plus or minus 6 inches horizontally from that shown on the drawings or approved by the Contracting Officer.
2. Axis of drilled hole - 2 inches maximum permissible deviation from line.
3. Bottom of drilled hole - plus or minus 24 inches in elevation. Maintain a minimum of 6 feet of cover over sleeve in determining location of exit portal.

1.4 PROJECT CONDITIONS

A. Limit activity within 20 feet each side of discharge line centerline from SH469 to edge of canyon rim, unless authorized by Contracting Officer.

B. Disturbance to the area shall be kept to a minimum. Light blasting will be permitted only when Contractor demonstrates the material is not ripable. No material shall be permitted to roll down canyon wall.

PART 2 PRODUCTS

2.1 PIPE SLEEVE: Weldable carbon steel suitable for application. Submit ASTM designation for approval.

2.2 SAND: A hard round silica sand having a specific gravity of 2.64 to 2.66 and graded as follows:

Sieve Size	Percent Passing
6	100
8	90-100
10	20-70
12	0-10
14	< 2

Sand shall be bagged and delivered to the site in 50 pound bags.

2.3 GROUT: Non shrink grout conforming to New Mexico Department of Highway Standard Specifications for Road and Bridge Construction Section 617.021. Must achieve 1500 psi in 3 days.

2.4 CONCRETE AND REINFORCING STEEL - STRUCTURAL CONCRETE: Section 03301.

2.5 FILTER FABRIC: Woven geotextile, Amoco 1198 or equal. Minimum flow rate of 50 gal/min/ft^2.

PART 3 EXECUTION

3.1 DRILLED HOLE

A. Drill pilot hole and ream to line and grade shown on the drawings.

B. Perform by heavy duty drill rig capable of penetrating rock at the angle and depth shown.

C. Caving conditions shall be corrected prior to resuming drilling.

D. Additional reaming may be required at no additional cost to Government should tolerances not be achieved.

3.2 PIPE SLEEVE

A. Installed and supported from the top. Design and installation of support will be Contractor's responsibility.

B. Joining of pipe shall be butt welding or threaded couplings installed. Capable of supporting the weight of pipe and sand fill in annular space between sleeve and HDPE pipe.

C. Concrete thrust blocks shall be cast against sound rock. All loose material shall be removed prior to forming.

D. Grout pressure shall be below the pressure that will cause lifting of the rock mass above the drilled hole.

3.3 DISCHARGE LINE

A. Hydrostatically test before sand backfill is placed.

B. Support pipe from top. Flange shall support weight of pipe.

C. Install damp sand in 8 foot lifts and consolidate by wetting and permitting free water to exit through perforated welded end plate and filter fabric.

3.4 SITE RESTORATION

A. Restore site to original condition. Top 24 inches of backfill shall consist of hand placed excavated rock within 50 feet of portals.

PART 4 PAYMENT

4.1 PAYMENT: Work described in this section including drilling, sleeve installation, pipe, grout, sand, concrete, metal work, excavation and backfill shall be paid per lump sum price in the schedule for all work within the limits shown on the drawings.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of boring and installing of a steel pipe sleeve for the subsequent installation of a removable 6" HDPE pipe under an existing state highway. Permitting and traffic control is included in the work.

1.2 RELATED WORK

A. Discharge line: Section 15064.

B. Structural Concrete: Section 03301.

C. Structure Excavation and Backfill: Section 02225.

1.3 QUALITY ASSURANCE

A. Comply with New Mexico Department of Highways regulations and requirements. Obtain all permits to work within right-of-way.

B. Submittals. Submit site plan with locations and dimensions of boring entry and exit pits, boring and sleeve installation equipment, traffic control and safety plan and sleeve material ASTM designation.

C. Tolerance for line and grade shall be 6 inches in all directions.

1.4 PROJECT CONDITIONS

A. No interruption of traffic at any time or in any direction will be permitted. Field verify location and elevations of all utilities including ditches before beginning work. Examine site and perform tests to determine boring and sleeve installation equipment and operation.

PART 2 PRODUCTS

2.1 PIPE SLEEVE: 16" OD minimum and .375 inch minimum thickness carbon steel pipe. Submit pipe material specifications for approval.

2.2 SAND: Fine, clean sand.

2.3 CONCRETE: Structural Concrete, Section 03301.

PART 3 EXECUTION

3.1 BORING AND EXIT PITS

A. Design, excavate and brace boring and exit pits for vertical dead and live loads; and lateral loads associated with earth and jacking loads. Boring and sleeve installation shall be from one end only.

B. Grade and divert surface water away from pits. Pits shall be kept in a dry condition.

3.2 SLEEVE INSTALLATION

A. Boring and sleeve installation shall be sequenced to ensure stability of roadway for all dead and traffic loads. Pipe sleeve shall be installed tight against surrounding material. Boring sleeve installation shall be completed in a continuous operation without interruption until such time as the sleeve is completely installed and without serious defects.

B. Sleeve shall be free of all materials prior to the installation of the discharge line.

C. Discharge line shall be hydrostatically tested and meet testing standards prior to filling annular space with sand.

D. Damp sand shall be pneumatically applied from both directions to fill annular space. Damp sand shall be manually packed at each end immediately prior to placing concrete end blocks.

E. Backfill and restore site to original condition after all work is completed.

PART 4 PAYMENT

4.1 PAYMENT: Work described in this section including traffic control and safety, boring and sleeve installation, pipe, sand, concrete and blocks, excavation and backfill shall be paid per lump sum price in the bid schedule for all work within the limits shown on the drawings.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of structure excavation and backfill for the buildings, vaults, tanks, retaining and other structures. The work also includes required materials testing.

B. For foundations, compacted or consolidated structural backfill, as defined herein, shall be placed in an "influence zone" defined as the area above a line which extends horizontally from the bottom exterior edge of the footing or foundation for one foot, and then proceeds upwards on a 1:1 slope to final grade. The work also includes preparation of areas to receive compacted or consolidated structural backfill.

C. Related Work: Section 02151 - Shoring.

1.2 QUALITY ASSURANCE

A. Geotechnical testing for quality control of the earthwork will be the responsibility of the Contractor at the Contractor's expense. If, in the opinion of the Contracting Officer, additional testing is required, the Contractor shall supply the additional tests at no additional cost. All testing shall be done by a certified independent testing entity with relevant experience. The Contractor shall facilitate testing by rerouting equipment or by temporarily closing the work area being tested. Materials and work which fail to meet the requirements shall be re-done and re-tested.

B. ASTM D 1557-78 will be the method used to determine maximum densities, and ASTM D 2922-81 or ASTM D 1556-82 will be used to determine in-place density. If ASTM D 2922-81 is used, at least ten percent of the results shall be verified by ASTM D 1556-82. In-place densities specified are minimums and may be exceeded.

1.3 SUBMITTALS

A. Certifications and Testing Reports for:
1. In-place density tests for compacted fill and backfill materials
2. Independent laboratory analysis samples of fill and backfill material proposed for use
3. Independent laboratory analysis samples of imported materials proposed for use
4. Source of fill and backfill materials proposed
5. Dewatering plan

1.4 JOB CONDITIONS

A. All excavation under this section will be considered unclassified regardless of the material encountered.

B. Utility lines shall be field-located prior to all excavation.

PART 2 PRODUCTS

2.1 STRUCTURAL BACKFILL

A. Structural backfill shall consist of fine, non-expansive granular material, free from debris, waste, frozen lumps, stone larger than 3", and other objectionable materials, approved by Soils Engineer and compacted to 95 percent of ASTM D 1557-78 or consolidated to 75 percent relative density for cohesionless material in accordance with ASTM D 2049-91. Backfill placed within 5 feet of any structure shall be placed using hand operated equipment. In addition this material shall have a liquid limit not exceeding 35 and a plasticity index of not over 10 when determined in conformity with AASHTO T-89-86 and T-90-86, respectively.

2.2 WATER

A. Clean, fresh and free from injurious quantities of oil, acid, alkali, organic matter, or other deleterious materials.

PART 3 EXECUTION

3.1 GENERAL

A. Provide required bracing, shoring, sheeting, and pumping. Excavate as required to facilitate the construction.

B. Upon completion of excavation and before placing forms or structures, Contractor shall inspect the excavation and notify the Testing Agency to begin testing the subsurface to determine and verify soil bearing and density values. Allow Contracting Officer to observe and review the results prior to construction of foundations or other work.

C. If the Contracting Officer approves excavation below the design elevation because of unsuitable foundation material, an equitable adjustment will be made. Excavate to an

elevation that the Testing Agency determines to be suitable, prepare area to receive structural backfill, and backfill as required with compacted structural backfill in accordance with these specifications.

3.2 PREPARATION OF AREAS TO RECEIVE STRUCTURAL BACKFILL

A. The site should be proof rolled. Any soft material that is present should be removed and replaced with a well-graded gravel conforming to the material requirements of New Mexico State Department of Highways (NMHD) (Standard Specification for Road and Bridge Construction, 1991), Section 304.21, Class IIB, for crushed surfacing base course. A 6-inch depth of sand base shall be placed under all slabs on grade.

3.3 PLACEMENT OF COMPACTED STRUCTURAL BACKFILL

A. Moisten prepared subgrade by lightly sprinkling water immediately prior to placing structural backfill. Structural backfill shall be placed on a prepared subgrade 6-inch layer compacted to a minimum of 95 percent of maximum dry density as defined by ASTM D 1557-78 (Proctor). Structural backfill shall be placed at between one percent wet and three percent dry of optimum moisture content as defined by ASTM D 1557-78. Backfill to the elevations and grades required to facilitate the construction.

B. Do not place backfill against concrete structures until concrete has cured sufficiently to accept the load and walls are properly shored.

C. Place structural backfill, maintaining symmetrical backfill loading. Compact each layer by hand tampers or other suitable equipment.

D. Ensure that backfill around the exterior of the building extends a minimum of two feet above the bottom elevation of the building footings, for frost depth.

E. Requirements for density testing and moisture content testing for compacted structural backfill and subgrade materials are as follows:
   1. For backfill below and immediately around storage tanks, provide a minimum of one density and moisture test per each 6" lift for every 500 square feet of surface area.
   2. For backfill around the Buildings and in the "influence zone", provide a minimum of one density and moisture test per each 6" lift for each 30 linear feet of wall length.
   3. Requirements for the amount of testing required for in-place subgrade materials (on which backfill or foundations are to be placed) shall be the same as for the backfill to be placed above the subgrade material in question.
   4. Provide a minimum of one Proctor density test or one relative density test for each type of soil used for backfill, and for other soils on which density readings are taken. Also provide a minimum of one Proctor density test or relative density test for each type of in-place subgrade material encountered. Relative density tests shall be used for cohesionless material.

3.4 DISPOSAL

A. Dispose of surplus and unsuitable material off-site and as authorized by the Contracting Officer.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of furnishing and installing utility line marking.

1.2 SUBMITTALS

A. As specified in Section 01300.

B. Samples: 24-inch strips of tape.

C. Certification that the materials used in the tape fabrication meet the requirements of this section.

D. Installation procedure if the cable is installed by plowing.

PART 2 PRODUCTS

2.1 MARKING TAPE: Capable of being inductively detected electronically.

A. Construction: Metallic foil laminated between two layers of impervious plastic film not less than 3 inches wide. Total thickness of tape shall not be less than 0.005 inch (5 mil) plus or minus 10 percent manufacturing tolerances.
1. Film: Inert plastic. Each film layer shall be not less than 0.0005-inch-thick (0.5 mil).
2. Foil: Not less than 0.00035-inch-thick (0.035 mil).
3. Adhesive: Compatible with foil and film.

B. Imprint: 3/4-inch or larger bold black letters.

C. Legend: Identify buried utility line tape with imprint such as "Caution: Sewer Line Below". Repeat identification at approximately 24-inch intervals.

D. Background Color: APWA color code and as specified below:

Color	Utility
Safety Red	Electric

Color	Utility
Safety Alert Orange	Telephone, Communications, Cable Television
Safety Precaution Blue	Brine
Safety Green	Sanitary Sewer, Storm Sewer

E. Manufacturer: Reef Industries, Inc., P.O. Box 750250, Houston, TX 77275, telephone: 800-231-6074, Fax: 713-937-2053, or approved equal.

PART 3 EXECUTION

3.1 MARKING TAPE

A. Install tape in backfill directly over each buried utility line. Place tape by plowing or during final backfilling.

B. Where utilities are buried in a common trench, identify each line by a separate warning tape. Bury tapes side by side directly over the applicable line.

3.2 ELECTRICAL CABLE AND CONDUIT SURFACE MARKERS: In addition to marking tape, install surface markers at all changes in horizontal direction or at intervals not exceeding 400 feet. Markers to be 2 1/2-inch hollow steel or iron pipe buried 24-inches below grade and extending 30" above grade.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of constructing gravel surfaced road, furnishing and installing culverts.

1.2 SUBMITTALS: Fabrication drawings of gate.

1.3 PROJECT CONDITIONS

A. Keep dust and water quality pollution to a minimum.

B. Meet all state of New Mexico requirements within their right-of-way.

C. Provide construction traffic control and safety requirements of New Mexico Department of Highways.

D. Verify location and elevation of utilities prior to initiating work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Embankment Materials: Free from brush, roots, and other organic material, cobbles and rocks more than 6 inches in size, coal, trash and other unsuitable material.

B. Gravel Surfacing: Base Course - Section 02232.

C. Culverts: Zinc Coated Corrugated Metal Pipe conforming to NMHD Standard Specifications for Road and Bridge Construction Section 501.02.

PART 3 EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Clearing and Grubbing - Section 02110.

B. Excavation, Borrow, and Embankment - Conform to NMHD Standard Specification for Road and Bridge Construction, Section 203 except no measurement will be made.

C. Subgrade Preparation - Conform to NMHD Standard Specifications for Road and Bridge Construction, Section 207 except no measurement will be made.

D. Shaping Roadbeds and Side Ditches - Conform to NMHD Standard Specifications for Road and Bridge Construction, Section 28 except no measurement will be taken.

E. Gravel Surfacing - Base Course, Section 02232.

F. Excavation and Backfill for Culverts - Conform to NMHD Standard Specifications for Road and Bridge Construction, Section 206.

PART 4 PAYMENT

4.1 PAYMENT

A. Measurement and payment for all work described in this section shall be paid for at the contract price bid for the items shown on the bid form, which prices and payment shall be full compensation for furnishing all the materials and doing all the work herein prescribed in a workmanlike and acceptable manner.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of furnishing and placing aggregate, and filler on a prepared subgrade.

1.2 SUBMITTALS

A. As specified in Section 01300. If materials are obtained from a commercial source, submit certification from the supplier certifying that aggregate base course meets the requirements of this section.

1.3 QUALITY ASSURANCE

A. Testing required to determine compliance with the requirements for the work of this section will be the responsibility of the Contractor.

B. Submit independent laboratory test data to the Contracting Officer for approval.

C. The Contractor shall cooperate by rerouting equipment or by temporarily closing the immediate work area being tested.

PART 2 PRODUCTS

2.1 AGGREGATE: Clean, hard, durable fragments or particles of crushed stone, crushed slag, or crushed or natural gravel. Materials that break up due to freeze-thaw or wet-dry cycling shall not be used.

A. Coarse Aggregate: AASHTO T96-77, percentage of wear of not more than 50.

B. Fraction passing No. 40 sieve shall have a liquid limit not to exceed 25 and a plasticity index of not more than 6, as determined by AASHTO T89-81 and T90-81, respectively.

C. Material, inclusive of filler, shall meet New Mexico Department of Highways Standard Specifications for Road and Bridge Construction Section 304.21, Class II-B.

3.4 SURFACE FINISHING

A. Use a smooth steel wheel roller for the final rolling of top surface base course. Water surface and evenly spread loose stones before final rolling. Make minimum of two complete passes over area to embed stones. Correct soft spots developed during rolling.

B. Compacted base course surface shall be smooth and free from waves and other irregularities. Unsatisfactory portions of base course shall be torn up, reworked, relaid, and rerolled, at no additional expense to the Authority.

3.5 MATERIAL ACCEPTANCE REQUIREMENTS: Acceptance will be based on periodic samples and tests taken following mixing and before laying.

3.6 TOLERANCES

A. Surface: The Contracting Officer will test finished surface of the base course with a 10-foot straightedge or other device. The variation between any two contacts with the surface shall not exceed ½ inch. Any areas not complying with these tolerances shall be reworked to obtain conformity.

B. Width: Plan dimension, plus or minus 2 inches.

C. Thickness: Plan dimension, plus or minus ½ inch.

3.7 MAINTENANCE: Maintain base course in a satisfactory condition until final acceptance.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of furnishing, hauling, and applying water required for compaction of embankments, backfills, subgrade, and base course, and for landscaping, dust control, and other construction operations.

1.2 RELATED REQUIREMENTS: Water availability - Section 01510.

PART 2 PRODUCTS

2.1 WATER: Free of debris, organic matter, and other objectionable substances.

PART 3 EXECUTION

3.1 APPLICATION: Use pressure type distributors or a pipeline equipped with sprinkler system. Provide approved meter devices near points of discharge.

A. Ensure a uniform application of water for optimum moisture content. Avoid excessive runoff and minimize water waste.

B. The Contractor may water excavation areas before excavating. Drill full depth of excavation to make moisture determinations.

C. If overwatering occurs, de-water at no additional expense to the Authority.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other items for which payment is made. The Contractor shall include in his bid price an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

SECTION 02605 VAULTS, MANHOLES, AND OUTLET WORKS

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of constructing all types of vaults and manholes.

1.2 SUBMITTALS

A. Submit shop drawings in accordance with Section 01300 to Contracting Officer for approval.

1.3 RELATED WORK

A. Structure Excavation and Backfill - Section 02225.

B. Discharge Line - Section 15064.

C. Brine Storage Tanks and Containment Structure - Section 11200.

PART 2 PRODUCTS

2.1 PRECAST CONCRETE MANHOLES: ASTM C478-90b.

2.2 MORTAR: One part portland cement, one part hydrated lime, and six parts sand.

2.3 RUNGS: Polypropylene steps, manufactured by M.A. Industries, 303 Divided Drive, Peachtree City, Georgia, 30269, or approved equal. Stainless steel rungs - ASTM A276.

2.4 GROUT: Neat portland cement and water.

2.5 FRAME AND COVER: FS RR-F-621D, gray cast iron.

A. Traffic: Type I, Style A, Size 24A frame; Type A, Size 24A nonventilated cover.

B. Nontraffic: Type IV, Size 22 frame; Type E, Size 22 nonventilated cover.

2.6 CONCRETE: Structural Concrete - Section 03301.

2.7 METALS: Steel - Section 05120
FABRICATION - Section 05500

2.8 VALVE SUPPORT

A. In vaults located in floodplain - stainless steel conforming to ASTM A593 Type 304.

B. In manholes and vaults elsewhere - galvanized steel conforming to AWSD1.1 Section 10.2

2.9 STAINLESS STEEL MANWAY AND BLIND FLANGE: Class 150 psi conforming to ASTM A312-79, gasket to suit application.

2.10 FILTER MATERIAL: Woven Geotextile, Amoco 1198 or equal.

2.11 BALL VALVES

A. Ball Valves: All shutoff valves in PVC pumping shall be full size port thermoplastic PVC ball valves with two way blocking capability, Viton o-rings, teflon seats with elastomeric backing cushions of the same material as the valve seals and socket ends. Ball valves shall be DUO-BLOK True Union design as manufactured by ASAHI/AMERICA of Malden, MA or approved equal. The port diameter of the valves shall not be smaller than the internal diameter of Schedule 80 PVC pipe. Ball valves must carry a 2 year guarantee. Four inch and larger valves shall be ANSI flanged.

2.12. AIR AND VACUUM VALVES

A. Air and vacuum valve shall be designed to allow large quantities of air to escape out the orifice when filling a pipeline and to close water tight when the liquid enters the valve. The Air & Vacuum Valve shall also permit large quantities of air to enter through the orifice when the pipeline is being drained to break the vacuum. The discharge orifice area shall be equal or greater than the inlet of the valve.

B. The valve shall consist of a body, cover, baffle, float and seat. The baffle will be designed to protect the float from direct contact of the rushing air and water to prevent the float from closing prematurely in the valve. The seat shall be fastened into the valve cover, without distortion, and shall be easily removed, if necessary. The float shall be stainless steel designed to withstand a maximum of 1000 psi. The float shall be center guided for positive shutoff into the seat.

C. Air & Vacuum Valves shall have NPT threaded outlets, 1" valves shall be provided with a vent cap having a built in bug screen. 3" valves shall be supplied with a steel protector hood.

All materials of construction shall be certified in writing to conform to ASTM specification as follows:

Body, cover	Cast iron	ASTM A126 Gr. B
Float	Stainless steel	ASTM A240
Seat	Buna-N	
Exterior paint	Phenolic primer	FDA approved for
	Red oxide	Potable water contact
Protector hood	Steel	

D. Valve to be APCO Series 140/150 Air & Vacuum Valve, as manufactured by Valve & Primer Corp., Schaumburg, Illinois, U.S.A. or approved equal.

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILL - Section 02221.

3.2 VAULTS AND MANHOLES

A. Cast-in-place: Construct at locations and to dimensions shown.

B. Precast Manholes: Set in grout making watertight joints.

C. Vents: Locate vents with return bend parallel to direction of river.

D. Valve Supports: Install plumb and firmly against valve body prior to filling discharge line.

3.3 FRAME AND COVERS: Install as shown, with top of cover flush with finish grade or ground surface. Grout frames to the concrete manhole section.

3.4 STEPS: Install steps in accordance with manufacturer's recommendations and as shown.

PART 4 PAYMENT

4.1 PAYMENT: Payment will be made in accordance with the price for valley vaults, plateau vaults, outlet works vault, and outlet works included in the bid schedule and the limits shown in the drawings. Payment for production well vaults will be made in accordance with the price for production wells included in the bid schedule.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of sanitary sewerage piping, fitting and accessories; connection to building sanitary system; and septic tank, distribution box and filter drainage field system.

1.2 DEFINITION

A. Material used as filter in drainage field system is hard, durable, uniformly graded, washed 3/8" gravel free of clay lumps and organic matter.

1.3 RELATED SECTIONS

A. Utility Trenching and Backfill - Section 02221.

B. Structural Concrete - Section 03301.

C. Vaults, Manholes, and Outlet Works - Section 02605.

D. Structural Steel - Section 05120.

1.4 SUBMITTALS

A. Pre-cast concrete, fiber glass or polypropylene septic tank and distribution box may be proposed for approval. Substitution must meet or exceed the storage, maintenance and structural requirements shown in the drawings.

B. An infiltration system may be proposed in place of the filter drainage field system.

C. Systems must demonstrate acceptability by New Mexico Environmental Division.

PART 2 PRODUCTS

2.1 SEWER PIPE MATERIALS

A. Sewer Pipe - ASTM D2729, PVC pipe.

B. Steel Plate and Shapes - ASTM A36, galvanized after fabrication, per ASTM A123 or A153.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with bedding material.

B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 02225 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated. Precast or premanufactured tanks shall be placed on 6" bedding.

B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth, compact to 95 percent standard proctor or 75 relative density.

C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 FILTER

A. Bottom and side of trench up to top of filter material shall be hand trimmed and left undisturbed until pipe and filter are installed. Prevent from entering trench after trimming.

B. Filter material shall be placed to bottom of pipe elevation and firmly tamped. Remaining filter material placed and tamped after pipe is installed.

C. Place geotextile filter continuous over filter materials. Lap 12" minimum.

3.5 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions. Seal joints watertight.

B. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

C. Install bedding at sides and over top of pipe to minimum compacted thickness of 12 inches compacted to 95 percent.

D. Refer to Section 02225 for trenching requirements. Do not displace or damage pipe when compacting.

E. Refer to Section 02607 for manhole requirements.

F. Connect to building sanitary sewer outlet.

G. Install utility line marking continuous over top of pipe 6 inches below finish grade, conforming with Section 02221.

3.5 INSTALLATION - CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place Cast-In-place Concrete base pad, with provision for sanitary sewer pipe end sections.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.6 FIELD QUALITY CONTROL

A. Request inspection prior to placing bedding.

B. Compaction testing will be performed in accordance with ASTM D1557.

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.7 PROTECTION

A. Protect finished installation under provisions of Section 01500.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. All work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of furnishing and placing concrete, including forming, reinforcement, joints, water stops, finishing, curing, and all related work. The work also includes required materials testing.

B. Related Work:
1. Section 02225: Structural Excavation and Backfill.
2. Section 05120: Structural Steel.
3. Section 07620: Flashing and Sheet Metal.
4. Section 07900: Sealants.

1.2 QUALITY ASSURANCE

A. Testing of concrete shall be the responsibility of the Contractor, at the Contractor's expense. If, in the opinion of the Contracting Officer, additional testing is required, the Contractor shall supply the additional tests at no additional cost to the Government. All testing shall be done by a certified independent testing entity with relevant experience. Work and materials which are defective shall be repaired or replaced and re-tested.

B. Concrete Mix Design (Ready-Mix):
1. Strength Requirements: ASTM C 94-89b.
2. Enforcement of Strength Requirements: Substitute the following for Paragraph 18.1 of ASTM C 94-89b:
   a. If the 28-day strength test fails to meet the requirements of Paragraph 17.5.2 of ASTM C 94-89b, the Contracting Officer may require that core samples be taken and tested in accordance with ASTM C 42-87, at Contractor's expense. If the core tests are below strength, if there is evidence of damage by freezing, or if the concrete fails to meet specifications in other ways, the Contracting Officer may require that the defective concrete be removed and replaced at no additional expense to the Government.
   b. Slump and Air Content Tests: Samples may be required after discharge of 15 percent and 85 percent of load. If slumps differ by more than 2 inches, the mixer or agitator shall not be used until condition causing this variation is corrected. The equipment for these tests will be furnished and the tests performed by Contractor's certified independent testing laboratory technician.

c. Compression Tests: Test specimens shall be taken and tested in accordance with ASTM C 31-88, using standard 6-inch diameter by 12-inch high cylinders, and shall be taken by the Contractor's certified independent testing laboratory technician. Curing, shipment to, and testing by an independent laboratory shall be at the expense of the Contractor. The Contractor shall supply 4 cylinders for every 20 cubic yards of concrete placed or for each major placement during the day.

1.3 SUBMITTALS

A. As specified in Section 01330.

B. Drawings: Submit detailed drawings complying with requirements of ACI 318-89, detailed in accordance with ACI Detailing Manual SP.66-88, and adapted to the proposed placement schedule, indicating size, dimension, bending, placing and construction joint details. Submit drawing showing locations of any construction joints not shown. Drawings shall be on minimum 18-inch by 24-inch drafting paper. Show type, size, and location of all slab and bar supports.

C. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, curing compounds, waterstops, sealants, hardener, stain (with manufacturer's standard colors), and other as requested by the Contracting Officer. Subject details and product data for all stay-in-place forms to be used on the project.

D. Certificates and Reports (Ready-Mix Concrete):
1. Concrete Mix Design: Comply with 5.4.2 of ASTM C 94-89b; furnish statement of composition of concrete mix and evidence that mix will meet quality specified herein.
2. Admixtures: Submit admixture types and manufacturers with a written statement that no chloride was added during manufacture.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Batch, mix, and transport concrete so slump will not increase nor decrease by more than 1 inch from design slump.

B. Storage: Store cement and aggregates to prevent deterioration or contamination. Store each size of aggregate separately. Do not use cement which has caked, partially set, or deteriorated, or any material which has become damaged or contaminated.

PART 2 PRODUCTS

2.1 FORMWORK

A. Contractor shall be responsible for design, strength, and safety of formwork. Formwork shall be designed to withstand vibrator action. Design, strength, spans, details, etc. of forms, including stay-in-place forms, shall be the Contractor's responsibility, and shall be in full conformance with the form manufacturer's recommendations.

B. Form Ties: Form ties for concrete shall be constructed so that no metal remains within 1 ½ inches of the surface of the wall after removal of formwork. The assembly should provide cone-shaped depression at the surface to allow proper filling and patching. Form ties in tanks shall have a water seal or a tightly fitted washer at midpoint for single rod ties.

C. Formside Materials:

1. Concrete exposed to view shall have smooth form finish. Use metal or plastic lined panels which will produce a smooth, hard, uniform texture on the concrete. Do not use materials with raised grain, torn surfaces, worn edges, patches, dents, or other defects that will impair the surface of the concrete.
2. Forms for Interior Exposed Finish Concrete: Unless otherwise indicated, construct formwork for interior exposed concrete surfaces with new plywood, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection. Use overlay plywood complying with PS 1-83, A-C or B-B High Density Overlaid Concrete Form, Class I.
3. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
4. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
5. Stay-in-Place forms shall be as shown on the Drawings and as specified herein.
6. Inspection before concreting prior to placing concrete, forms should be inspected for cleanliness, accuracy of alignment and reinforcing steel clearances.

2.2 REINFORCEMENT

A. Details of concrete reinforcement not shown shall be in accordance with CRSI Manual of Standard Practice-80.

B. Reinforcing Steel:
   1. All reinforcing, except No. 2 bars, sleeved dowel bars, and column spirals, shall consist of deformed bars.
   2. Reinforcing steel bars shall comply with ASTM A 615-89, including Supplementary Requirements S1, and shall be Grade 60. Bars smaller than No. 4 may be Grade 60 or Grade 40. Steel shall be free from rust, scale, oil, and frost.

C. Welded Wire Fabric: Sheet form, of gauge and mesh size shown, and meeting the requirements of ASTM A 185-88 or ASTM A 497-89 for smooth wire fabric. If size is not indicated, use WWF 6x6 W2.9xW2.9. Wire fabric shall be free from rust, scale, oil, and frost.

D. Bar supports in structural tank slabs and exposed to view at concrete surfaces shall be Class 1 (plastic protected), as specified in the CRSI Manual of Standard Practice, Chapter 3. Footings and slabs on grade may use concrete bolsters or metal chairs for bar supports.

2.3 CONCRETE

A. General Requirements: Conform to New Mexico State Department of Highways Standard Specifications for Road and Bridge Construction Section 503.12, Class D Concrete.
   1. Portland Cement:
      a. ASTM C 150-89, Type II. Use cement containing not more than 0.60 percent alkalies (calculated as the percentage of sodium oxide plus 0.658 times the percentage of potassium oxide) in concrete with aggregate that may be deleteriously reactive.
      b. For all structures, use Type II, modified to a maximum of 5 percent of the tricalcium aluminate content.
      c. Use one brand of cement throughout project unless approved otherwise.
   2. Admixtures: Subject to approval.
      a. No admixtures containing chlorides will be permitted.
      b. Fly Ash: ASTM C 618-89. Use Class F. Allowable substitution of fly ash for cement is up to a maximum of 15 percent by weight of total cementitious material upon approval of Contracting Officer.
   3. Strength: 28-day compressive strength shall be 4,000 pounds per square inch minimum for all structures.
   4. Water: Potable.
   5. Aggregate: Conform to AASHTO M-80 and M-6 for coarse and fine aggregates respectively.

B. Ready-Mix Concrete:
   1. Materials: Materials, including cement, aggregates, water, and admixtures, shall meet

the requirements of Class D, Concrete, subject to the additional requirements of this section.

2. Quality of Concrete: Concrete shall be furnished under Alternative No. 3, ASTM C 94-89b, whereby the manufacturer assumes full responsibility for the selection of the proportions for the concrete mixture, with the minimum allowable cement content specified. Submit statement of composition as specified in Part 1 of this section.
3. Air Content: Entrained air quantities shall comply with Table 3 per Paragraph 7 of ASTM C 94-89b:
   a. 6 ± 1 percent for coarse aggregate size 1" and 3/4"
4. Maximum water - cement ratio: 0.45.
5. Manufacture and Delivery: Measurement of materials, batching, mixing, transporting, and delivery shall be as specified in ASTM C 94-89b. Discharge concrete into forms within 1-1/2 hours after introduction of water to cement. When temperature of concrete is 85 degrees F or above, the time between introduction of water to cement and complete discharge of concrete into forms shall not exceed 45 minutes. If the manufacturer cannot meet these requirements, then the water and cement shall be introduced into the mix at the project site.

2.4 PATCHING GROUT

A. For Liquid Storage: Sikagrout 212 and Sikadur 32 manufactured by Sika Corporation, 875 Valley Brooks Avenue, Lyndhurst, NJ 07071, Ph (201) 933-8800, or approved equal.

2.5 EXPANSION JOINT FILLERS

A. Pre-molded type, ANSI/ASTM D 1751-83. Size, ½ inch by depth of slab minus ½ inch, manufactured by W. R. Meadows, Inc., Box 543, Elgin, IL 60121, Ph (708) 683-4500, or approved equal.

2.6 EXPANSION JOINT SEALANTS

A. Sonolastic NP1 (one component), or NP2 (two component) joint sealant as manufactured by Sonneborn Building Products, ChemRex, Inc., 7711 Computer Ave., Minneapolis, MN, 55435, Ph (800) 433-9517, or approved equal.

2.7 CONTROL JOINT SEALANT

A. Will-Seal W/S 250 precompressed expanding foam sealant as manufactured by Illbruck, 3800 Washington Avenue North, Minneapolis, MN 55412, or approved equal.

B. Compriband V as manufactured by Phoenix Building Products, New York, NY, or approved equal.

C. Sika Flex 1A elastic sealant/adhesive as manufactured by Sika Corp., Lyndhurst, NJ, or approved equal.

2.8 WATERSTOPS

A. Provide in joints as shown on Drawings. Waterstops shall be 4 inch by 3/8-inch nominal thickness dumbbell centerbulb, continuous. Provide DB6-14 dumbbell centerbulb waterstop as manufactured by Vinylex Corporation, P.O. Box 7187, Knoxville, TN 37921, Ph (615) 690-2211, or approved equal, secured to special additional reinforcement as shown in the Drawings.

2.9 NONSHRINK GROUT

A. Masterflow 713, manufactured by Master Builders, Inc., Construction Products Division, 23700 Chagrin Blvd., Cleveland, OH 44122, Ph (216) 831-5500, or approved equal.

2.10 BONDING AGENT

A. Concresive 1001-LPL, manufactured by Adhesive Engineering Company, 1411 Industrial Rd., San Carlos, CA 94070, Ph (415) 592-7900, or approved equal.

2.11 CURING MATERIALS

A. Curing compound or material shall be compatible with required finishes and/or coatings.

B. Sheet Materials: ASTM C 171-69(1986), 4-mil polyethylene film or waterproof paper.

C. Spray Applied Membrane Forming Liquids: Masterseal, by Master Builders, Inc., Construction Products Division, 23700 Chagrin Blvd., Cleveland, OH 44122, Ph (216) 831-5500, or approved equal.

D. Moisture cure slabs and walls where curing compound or material are incompatible with required finishes and/or coating. Include walls below grade that are to receive waterproofing membrane.

E. Curing compound shall be in accordance with ACI 318-89 and ACI 301-89.

2.12 FLOOR HARDENER AND SEALER

A. Floor Hardener: Colorless aqueous solution of zinc and/or magnesium fluosilicate combined with a wetting agent containing not less than 3 lbs. of fluosilicate crystals per gallon. "Surfhard" by Euclid Chemical, Division of RPM, Inc., 19218 Redwood Rd., Cleveland, OH, Ph (216) 531-9222, "Lapidolith" by Sonneborn Building Products, ChemRec, Inc., 7711 Computer Ave., Minneapolis, MN, 55435, Ph (800) 433-9517, "Saniseal" by Master Builders, Inc., Construction Products Division, 23700 Chagrin Blvd., Cleveland, OH 44122, Ph (216) 831-5500, "Burk-O-Lith" by the Burke Company, a subsidiary of Alama-Systems, 2655 Campus Dr., San Mateo, CA 94403, Ph (415) 349-7600, or approved equal.

B. Floor Sealer: Waterborne, transparent sealing and dustproofing compound consisting of a liquid blend of polymers. Kure-N-Seal WB by Sonneborn Building Products, ChemRec, Inc., 7711 Computer Ave., Minneapolis, MN, 55435, Ph (800) 433-9517 or approved equal.

2.13 ANCHORING SYSTEMS

A. Anchor Bolts: ASTM A 307-89 nonheaded type unless otherwise indicated or stainless steel equivalent where indicated on drawings.

B. Hilti HIT C-100 Adhesive by Hilti Fastening Systems, P.O. Box 21148, Tulsa, OK 74121, Ph (800) 879-8000.

C. Hilti HVA Adhesive Anchor by Hilti Fastening Systems.

PART 3 EXECUTION

3.1 FORMWORK

A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are correct size, shape, alignment, elevation and position. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials. Provide stay-in-place forms in accordance with manufacturer's recommendations.

B. Arrange formwork construction to allow for proper sequencing and removal without damage. Use orderly and symmetrical panel arrangement with minimum number of joints. Mount panels on rigid supports to minimize deflection. Before proceeding, secure approval of formwork and procedures.

C. Forms: Sufficiently tight to prevent loss of mortar. Treat nonmetal forms with a nonstaining material to eliminate absorption of water by forms and to act as a form release agent.

D. Thoroughly remove all dirt, mortar, and foreign matter before each use. Where the bottom of the form is inaccessible from within, access panels shall be provided to permit thorough removal of extraneous material before placing concrete.

E. Curved forms for curb and gutter and foundation ring may be built up by a series of tangent surfaces in lieu of a true curve as shown, provided the tangent length shall be no more than 1/50 of the radius.

F. Chamfer all exposed horizontal and vertical edges or outer corners 3/4 inch, both interior and exterior of structures, except where wood framing or floor makes contact with concrete.

G. Where tolerances are stated elsewhere in these specifications or drawings for any individual structure or feature, permissible deviations from established lines, grades, and dimensions are listed below:

1. Variation From the Plumb:
   a. In the lines and surfaces of columns, walls, and in arises: in 10 feet, 1/4-inch; in any story or 20 feet maximum, 3/8-inch; in 40 feet or more, 3/4-inch.
   b. For exposed corner control-joint grooves and other conspicuous lines: in any bay or 20 feet maximum 1/4-inch; in 40 feet or more, ½-inch.
2. Variation From the Level or From the Grades Shown:
   a. In floors, ceilings, and beam soffits: in 10 feet, 1/4-inch; in any bay or 20 feet maximum, 3/8-inch; in 40 feet or more, 3/4-inch.
   b. For exposed horizontal grooves and other conspicuous lines: in any bay or 20 feet maximum, 1/4-inch; in 40 feet or more, ½-inch.
3. Variation of the linear building lines from established position in plan and related position of walls and partitions: in any bay or 20 feet maximum, 1/4-inch; in 40 feet or more, ½-inch.
4. Variation in the sizes and locations of sleeves, floor openings and wall openings: 1/4-inch.
5. Variation of cross-sectional dimensions in the thickness of slabs and walls: minus, 1/4-inch; plus, ½-inch.
6. Footings:
   a. Variation in dimension in plan: minus, ½-inch; plus, 2-inch.
   b. Misplacement or eccentricity: 2 percent of the footing width in the direction of misplacement but not more than 2 inches.
   c. Reduction in thickness: minus 5 percent of specified thickness.
7. Variation from established lines and grades in sidewalks, plazas, outdoor concrete slabs, curb and gutter sections: in 10 feet, 1/4-inch; in 1 foot, 1/8-inch.

H. Ensure that all exterior building footings are placed a minimum of three feet below finished grade, for frost depth.

3.2 REINFORCEMENT

A. Design: The reinforcement design shown on drawings shows only the necessary information for detailing the reinforcement and preparing placing and bending details.

B. Bending: In accordance with CRSI Manual of Standard Practice (1992), Chapter 7.

C. Placement: Place reinforcement accurately as shown. Adequately secure metal reinforcement in position by concrete or metal chairs and spacers, in accordance with CRSI Manual of plastic coated or other non-corrosive standard practice. Distance between the steel and the surface, as shown; otherwise, in accordance with the CRSI Manual. In walls, use bolsters or chairs between form and reinforcement to prevent lateral displacement of reinforcement and to ensure proper concrete cover.

D. Splices:
1. Locate splices of reinforcement as shown. For any splices not shown, provide splice length as called for on the Drawings.
2. In beams and slabs, all top bars shall be spliced at midspan and all bottom bars shall be spliced at supports.
3. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
4. Make outside bars continuous at corners.

E. Dowels: Extend minimum 24 diameters. Refer to drawing for minimum development length.

F. Protect exposed reinforcement bars intended for bonding with future extensions from corrosion by using adequate covering.

G. Inspection: After reinforcement has been placed, it shall be inspected prior to placing the concrete.

H. Condition of Surfaces: At time concrete is placed, all metal reinforcement shall be free from rust, scale, frost, or other coatings that would destroy or reduce the bond.

3.3 JOINTS AND EMBEDDED ITEMS

A. Construct all joints true to line with faces perpendicular to surface.

B. Construction Joints: Locate and install construction joints where shown on Drawings and to separate walks from walls, curbs, and other structures.
   1. Obtain approval for vertical and horizontal joints not shown on Drawings and locate them where they least impair the strength of the structure. Joints in walls shall be at the underside of roofs and at 5 ½ above the top of footings or floor slabs unless otherwise shown on Drawings. Make joints perpendicular to the main reinforcement. Tank walls shall have water stop at all vertical and horizontal joints.
   2. Continue all reinforcing steel and mesh across construction joints.
   3. Tool Joints (Control Joints): Cut one-third depth with suitable tool when concrete is plastic. Finish all edges with an edger or a groover. Space walk joints as shown. Type and spacing of joints for walks and curb to match existing construction.
   4. Clean the surface of the concrete and remove all laitance of construction joints prior to placement of subsequent concrete.
   5. To obtain bond, roughen joint surfaces.

C. Expansion Joints: Install expansion joint fillers as shown on Drawings.

D. Waterstops:
   1. The design and location of waterstops shall be as shown on Drawings. Each piece of premolded waterstop shall be of maximum practicable length to minimize the number of end joints.
   2. Make joints at intersections and at ends of pieces following manufacturer's instructions. Joints shall develop effective watertightness fully equal to that of the continuous waterstop material and shall develop not less than 50 percent of the mechanical strength of the parent section. Do not lap sections of waterstop. All joints shall be butt spliced using a heat sealing method. For control joints, apply joint sealer in accordance with the manufacturer's recommendations.
   3. Support waterstops securely against displacement by wire ties to reinforcement between the last rib and the end of the waterstop, or method specifically recommended by the manufacturer.

E. Other Embedded Items, Penetrations, and Blockouts:
   1. Before concreting, place all required sleeves, inserts, trench drains, anchor bolts, and embedded items. Anchor to prevent flotation and displacement.
   2. Give all trades whose work is related to the concrete ample notice and opportunity to introduce embedded items before concrete is placed.

3. Position expansion joint material, waterstops, and embedded items accurately and support them against displacement. Fill voids in sleeves, and inserts, and anchor slots temporarily with readily removable material to prevent the entry of concrete.
4. Work Structural Drawings with other project drawings together to provide all required blockouts and penetrations in concrete structure. Provide reinforcing around all penetrations and openings per requirements given on Structural Drawings.

3.4 MIXING (Ready-mix Concrete)

A. When the concrete is mixed completely in a truck mixer, 70 to 100 revolutions at the mixing speed specified by the manufacturer are required to produce uniformity of the concrete.

3.5 PREPARATION OF FORM SURFACES

A. Ensure that forms are clean and free of ice, water, and concrete deposit.

B. Seal plywood with coating material to minimize absorption of moisture from the concrete.

C. Coat textured forms with release agent and others where required. Application shall be prior to reinforcement placement.

D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.6 DEPOSITING

A. Discharge concrete into forms within 1-1/2 hours after introduction of water to cement. When temperature of concrete is 85 degrees F or above, the time between introduction of water to cement and complete discharge of concrete into forms shall not exceed 45 minutes.

B. Concrete delivered shall have the following maximum and minimum temperatures.

Outside Air Temperature	Minimum Concrete Temperature	Maximum Concrete Temperature
45 degrees F & above	55 degrees F	90 degrees F
30 to 45 degrees F	60 degrees F	90 degrees F
0 to 30 degrees F	65 degrees F	90 degrees F
Below 0 degrees F	70 degrees F	90 degrees F

C. Do not use calcium chloride salt and other materials containing anti-freeze agents or chemical accelerators unless otherwise accepted in mix design.

3.7 CONVEYING

A. Convey concrete from mixer to place of deposit by methods which will prevent separation or loss of materials. Equipment from chuting, pumping, and pneumatically conveying concrete shall not be aluminum and shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation, segregation, contamination, or other degradation of the concrete.

3.8 PLACING OF CONCRETE

A. Preparation Before Placing:
1. Remove hardened concrete and foreign materials from inner surfaces of conveying equipment.
2. Check formwork for completion, check position and securement of reinforcement, expansion joint material, sleeves, anchors, and other embedded items, and obtain approval on entire preparation.
3. Remove ice and excess water and sprinkle semiporous subgrades sufficiently to eliminate suction.
4. Do not place concrete on frozen ground.
5. Do not place concrete during rain, sleet, or snow unless protection is provided.

B. Depositing:
1. Concrete for all four walls of cast-in-place vaults and tank shall be placed in one lift without joints for the full height of the wall.
2. Place concrete in final position to avoid segregation due to rehandling or flowing. Spread concrete in horizontal layers and do not drop more than 5 feet without using drop chutes. Place concrete at such a rate that the concrete remains plastic and flows readily into spaces between bars. Place concrete before it has taken its initial set and, except for ready-mixed concrete or concrete being agitated, deposit within 30 minutes after mixing. Do not deposit concrete that has partially hardened or become contaminated by foreign material. Lifts shall be kept between 6 inches and 20 inches high and shall be of a height to minimize surface defects and eliminate rock pockets and cold joints.
3. Deposit concrete continuously and rapidly enough so that the layer supporting the one being placed is still plastic. If continuous placement is impossible, locate construction joints where shown or as approved. Do not use partially hardened or contaminated concrete.
4. Remove temporary form spreaders when concrete reaches them.
5. Do not begin placing concrete in supported elements until the concrete previously placed in beams and walls is no longer plastic.

6. Deposit concrete as near to its final position as possible to avoid segregation due to rehandling or flowing. Do not subject concrete to any procedure that will cause segregation.

C. Compacting:
1. Use high frequency vibrators in the placement of concrete in forms. When concrete is being placed on hardened concrete or in bottom of forms, exercise care to ensure complete consolidation. After the initial lift, vibrator shall penetrate through and into top of previous lift of concrete.
2. Internal vibrators shall have a minimum frequency of 8,000 rpm. Overvibrating and use of vibrators to transport concrete within forms shall not be allowed. Insert and withdraw vibrators at many points, from 18 to 30 inches apart, for 5 to 15-second duration. Keep a spare vibrator on the project site during all concrete placing operations.
3. Once concreting is started, it shall be carried on as a continuous operation until the placing of the panel or section is completed, preventing fresh concrete from being deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the section.
4. Remove splashes or accumulations of hardened or partially hardened concrete or mortar on forms or reinforcement above general level of the concrete already in place before the work proceeds.
5. Maintain reinforcement in proper position during concrete placement operations.
6. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surfaces free of lumps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

D. Bonding:
1. Where fresh concrete is to be placed against and bonded to hardened concrete, chip existing surface (1" minimum), dampen the prepared surface and provide a bed of rich cement mix over the surface.

3.9 SHORES AND SUPPORTS

A. Comply with ACI 347-88 for shoring and reshoring in and as herein specified. Contractor will be fully responsible for the design, construction, and performance of shoring and reshoring.

B. Extend shoring from ground to roof for all structures unless otherwise permitted.

C. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support work without excessive stress or deflection.

1. Keep reshores in place a minimum of 15 days after placing upper tier, and longer if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

D. Provide stay-in-place forms in full accordance with the manufacturer's recommendations.

3.10 FORM REMOVAL

A. Carefully remove forms to ensure the complete safety of the structure. Vertical forms may be removed after 72 hours, providing the concrete will not be injured. All supporting forms shall remain in place for a minimum of 14 days and until concrete has obtained design minimum compressive strength at 28 days. Do not remove supporting forms or shoring until members have acquired sufficient strength to support their weight and imposed loads safely. Comply with membrane manufacturer's recommendations regarding stripping of forms used on the interior of all water and wastewater containment tanks. See Sections 07120 and 07900 for these requirements.

3.11 REPAIRING AND PATCHING

A. Patch all the tie holes and all repairable defective areas immediately after form removal.

B. All honeycombed and other defective concrete shall be removed to sound concrete with edges perpendicular to the surface. Dampen the area to be patched and an area at least 6 inches wide surrounding it to prevent absorption of water from the patching grout. Mix patching grout to the consistency of thick cream and brush it well into the surface.

C. Make the patching grout of the same material and approximately the same portions as used for the concrete, omitting the coarse aggregate. The resultant grout shall consist of not more than 1 part cement to 2-1/2 parts sand by damp loose volume.

D. Do not use more mixing water than necessary for handling and placing. Mix the patching grout in advance and allow to stand with frequent manipulation with a trowel, without adding water, until it has reached the stiffest consistency that will permit placing.

E. After surface water has evaporated from the area to be patched, brush the patching grout well into the surface. When the patching grout begins to lose the water sheen, apply the premixed patching grout. The grout shall be thoroughly consolidated into place and struck off to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, leave the patch undisturbed for at least 1 hour before finishing it. Keep the patched area damp for 7 days. Do not use metal tools in finishing a patch in a formed wall that will be exposed.

F. Tie holes: Clean and thoroughly dampen, then fill solid with patching grout.

G. For openings in liquid storage structures, 6 inches or larger across, thoroughly clean the complete surface of the opening. Apply Sikadur 32 Hi-Mod epoxy grout to the concrete surface per the manufacturer. Form the opening as needed to contain the Sikagrout 212. When the epoxy is set and the formwork is in place, pump the Sikagrout 212 in high flow (per manufacturer) to fill the opening. Plug the formwork and allow the patch to cure per the manufacturer.

3.12 FINISHES FOR FORMED SURFACES

A. Rough Form Finish: Leave surface with texture imparted by the forms on foundation walls below finished grade.

B. Smooth Form Finish: On concrete above finished grade and interior concrete exposed to view, completely remove all fins.

C. Related Unformed Surfaces: At top of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.13 SLABS

A. Screeding: After concrete has been thoroughly consolidated, screed slabs to the desired elevation and contours by means of accurately placed edge forms and intermediate screed strips.

B. Jointing: Locate and construct control joints as shown.

C. Floated Finish: Apply float finish to all interior slab surfaces to receive trowel finish as indicated on Architectural Drawings.
   1. Place, consolidate, strike off, and level concrete, but do not work it further until ready for floating. Begin floating when water sheen has disappeared and when the surface has stiffened sufficiently.
   2. During or after the first floating, check planeness of surface with a 10-foot straightedge applied at not less than two different angles, and then cut down all high spots and fill all low spots to achieve a true plane within 1/4 inch in 10 feet.
   3. Refloat slab immediately to a uniform sandy texture.

D. Troweled Finish: Apply trowel finish to all interior slab surfaces as indicated on Architectural Drawings.
   1. Float finish slab as described above, then steel trowel by machine or by hand. Additional troweling shall be done by hand after the surface has hardened sufficiently. Final troweling shall produce a ringing sound from the trowel and then finish surface shall be free of trowel marks and uniform in texture.

E. Broom Finish: Immediately after floating, give slabs for exterior stoops a coarse transverse scored texture by drawing a broom across the surface perpendicular to line of traffic. Broom finish all exterior slab in pattern shown on Drawings.

F. Depress all floor drains one inch. Taper the one inch depression over a two foot radius.

3.14 FLOOR SEALER AND DUSTPROOFER

A. Interior floors as indicated on Architectural Drawings shall receive sealer and dustproofer in accordance with the manufacturer's recommendations.

B. Apply hardener after floors have cured, in accordance with the manufacturer's recommendations.

C. Floors shall receive application of sealer, mixed and applied as recommended by manufacturer.

3.15 CURING AND PROTECTION

A. Do not apply curing or sealing compound to slabs scheduled to receive flooring only.

B. General: Beginning immediately after placement, protect concrete from drying, excessively hot or cold temperatures, and mechanical injury. Keep moisture loss to a minimum until cement has hydrated and concrete is cured.

C. Curing:
   1. Formed Surfaces: Keep forms wet. Cool metal forms exposed to the sun with water. Forms shall remain in place for 7 days unless material specified for curing materials in Part 2 is applied. If curing compound is used, apply in accordance with manufacturer's instructions. Curing compound shall not be used on any wall scheduled to be painted.
   2. Slabs: Immediately after finishing, apply one of the materials specified in article entitled "Curing Materials", but use membrane forming liquid only with Contracting Officer's approval.

3. Do not use liquid membrane curing compound on floors to receive sealer or vinyl flooring and on walls to be painted or stained.
4. Duration of Curing: 7 days minimum.

D. Protection:
1. In cold weather, maintain the moisture conditions but also, by heating or covering, maintain temperature of the concrete between 50 degrees F and 70 degrees F for entire curing period.
2. In hot weather, take immediate steps to protect newly finished concrete from the drying effects of wind and sun, and maintain temperature of the air surrounding the concrete uniform within 5 degrees F in any one hour or 50 degrees F in any 24-hour period.
3. During curing period, protect concrete from mechanical damage, loading, shock, and vibration.

E. Methods of curing shall be as follows:
1. Provide moisture-retaining cover curing as follows: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
2. Provide water curing as follows: Keep concrete surface continuously wet by covering with water, or continuous water-fog spray. Cover concrete surface with absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
3. Provide Liquid Membrane Forming Curing Compound as follows: Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period. Use Liquid Membrane Curing Compound only as approved by the Contracting Officer.

3.16 CONSTRUCTION OF CONCRETE FILL AND EQUIPMENT PADS

A. Sump area may require concrete fill as shown on Drawings. Existing window and door openings to be closed shall have concrete fill as shown on Drawings.

B. For size and location of miscellaneous equipment pads, refer to Process Drawings. Pads shall be 6" minimum thickness and reinforced with #4 at 12" each way.

C. Concrete fill and equipment pads shall be placed as soon as possible after completion of the curing period of the walls and structural floor. Contact surfaces shall be thoroughly cleaned to the degree recommended by the bonding agent manufacturer.

D. Bonding agent shall be accurately and thoroughly mixed and applied at the manufacturer's recommended coverage rate. Mix only the amount which can be used prior to expiration of the pot life. Concrete shall be immediately placed over the fresh surface before setting of the agent. Bonding agent which sets up prior to placing concrete shall be recoated with a fresh coat.

E. Concrete fill and equipment pads shall be accurately screeded to the slopes and elevations shown and steel trowel finished. Cure concrete as specified for slabs above. Set equipment anchor bolts at correct elevations in pad to accommodate equipment furnished.

3.17 GENERAL WATERTIGHTNESS

A. Watertightness is required for all concrete and concrete joints on this project. Leakage at joints shall be corrected.

3.18 CONSTRUCTION LOADS ON STRUCTURAL TANK TOP SLABS

A. If shoring is removed, no construction materials and equipment shall be allowed on the structural floor until the concrete has reached the 28-day compressive strength. All superimposed construction loads will then be limited to the design load of the slabs.

3.19 NONSHRINK GROUT

A. Use nonshrink grout to fill sleeves and voids under equipment bases. Grout shall be mixed and used in accordance with manufacturer's recommendations. Exposed edges shall be smooth, straight, and even.

3.20 TESTING CONCRETE

A. Four compressive test specimens shall be taken for every 20 cubic yards of concrete placed or for each major placement during the day. The Contracting Officer has the option to direct the Contractor to take the required test specimens as he deems necessary to ensure the concrete meets the specification. Air content, slump, and concrete temperature shall also be taken with each set of compressive test specimens. Tests shall be taken in accordance with Part 1 of this Section.

B. Specimens shall be taken, cured, and tested for compressive strength in accordance with ASTM C 172-82, ASTM C 31-88, and ASTM C 39-86, respectively.

C. Standard age of compressive test shall be 28 days; however, 7-day tests may be used provided that the relation between the 7-day and 28-day strengths of the concrete is established by test for the materials and proportions used.

D. Air content and slump test are to be taken in accordance with Part 1 of this Section.

3.21 DAMAGED OR DEFECTIVE CONCRETE

A. Remove damaged or defective concrete before completion and acceptance of the work and replace with acceptable concrete.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other terms for which payment is made. The Contractor shall include in his price bid an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 Description

A. The work included in this section consists of furnishing and installing masonry work. Build into masonry all bolts, anchors, reinforcing, frames and accessories required for completion of the work.

1.2 RELATED WORK

A. Section 03301: Concrete.

B. Section 05120: Structural Steel.

C. Section 08100: Metal Doors and Frames.

D. Section 07181: Water Repellent Penetrant.

1.3 QUALITY ASSURANCE

A. Chapter 24 - Masonry of the Uniform Building Code, 1991.

B. Fire Performance Characteristics: Comply with the requirements for materials and installation established by governing authorities for the construction and fire resistance rating indicated or required by Code. Provide materials and construction identical to those assemblies whose fire endurance has been determined by testing in compliance with ASTM E119-88 or as acceptable to the authority having jurisdiction.

1.4 SUBMITTALS: As specified in Section 01300.

A. Prior to fabrication of masonry units, submit samples of each type of masonry unit for review. Review is for color and texture only.

B. Submit product literature for masonry accessories.

C. Submit certificates stating compliance with specification for masonry unit grades, types and classes.

D. Submit mix designs for grout for masonry reinforcement. Provide test results from an independent testing laboratory certifying conformance to grout strength requirements and UBC Standard 24-22.

1.5 PROJECT/SITE CONDITIONS:

A. Cold Weather Protection: Before beginning work, remove ice or snow formed on top of foundation wall or base construction upon which masonry will set. Carefully apply heat until top surface is dry to the touch.

B. Cold Weather Construction Requirements: Implement cold weather construction procedures when any of the following conditions exist:
   1. The ambient temperature falls below 40° F.
   2. The temperature of masonry units is below 40° F.
   3. Do not lay masonry units having a temperature below 20° F. Remove visible ice on masonry units before unit is laid.
   4. Heat mortar sand or mixing water to produce mortar temperatures between 55° F and 120° F at the time of mixing. Maintain mortar above 40° F until used in masonry.
   5. When ambient temperature is between 25° F and 20° F, use heat sources on both sides of the masonry under construction and install wind breaks when wind velocity is in excess of 15 mph.
   6. When ambient temperature is below 20° F, provide an enclosure for the masonry under construction and use heat sources to maintain temperatures above 32° F within the enclosure.
   7. When mean daily temperature is between 40° F and 25° F protect completed masonry from rain or snow by covering with a weather resistive membrane for 24 hours after construction.
   8. When mean daily temperature is between 25° F and 20° F, completely cover completed masonry with insulating blankets or equal protection for 24 hours after construction.
   9. When mean daily temperature is below 20° F, maintain masonry temperature above 32° F for 24 hours after construction by enclosure with supplementary heat.
   10. Remove and replace work which has been frozen or damaged by freezing conditions.
   11. Failure to follow cold weather procedures shall be prima facie evidence that masonry has frozen. Such masonry shall be removed and replaced.

C. Cold weather grouting requirements: Temperature of masonry to be grouted must be greater than 35° F when grout is placed. Place grout in masonry at a minimum temperature of 70° F and a maximum temperature of 120° F. Maintain grouted masonry above 35° F for 24 hours following placement of grout.

D. Hot weather construction requirements: Implement hot weather construction procedures when the ambient air temperature exceeds 100° F, or 90° F with a wind velocity greater than 8 mph. Do not spread mortar beds more than 4 ft. ahead of masonry. Set masonry units within one minute of spreading mortar.

1.6 STORAGE AND PROTECTION OF MATERIALS

A. Store all masonry units and materials off the ground in a manner to prevent damage, deterioration, contamination, or wetting by rain, snow or ground water. Reject cement which has become caked, partially set of otherwise deteriorated, or any material which has become damaged or contaminated. Cover all masonry materials to protect from elements.

1.7 PROTECTION OF WORK:

A. Protect facing material and all adjoining work against staining. Keep tops of walls covered with non-staining waterproof covering when work is not in progress. Extend cover 24" down face of wall, hold cover securely in place. When work is resumed, clean top surface of work of all loose mortar.

B. Do not apply loads for at least three days after building masonry columns or walls.

C. Prevent grout or mortar from staining the face of exposed masonry. Protect all sills, ledges, projections and adjacent materials from damage.

D. Be responsible for the protection and bracing of the masonry during construction to prevent damage or loss due to wind.

PART 2 PRODUCTS

2.1 MASONRY

A. Medium weight concrete block units conforming to ASTM C90-92b for hollow units, Grade N. Comply in all respects with the block requirements of the National Concrete Masonry Association ground face as shown on architectural drawings.

2.2 MORTAR AND GROUT

A. Mortar: Proportion Type S per ASTM C270-92a for plain masonry and PM or PL per ASTM C476-91 for reinforced masonry.

B. Grout: conform to ASTM C476-91. Provide grout with a minimum 28-day compressive strength of 3,000 psi.

2.3 STEEL

A. Lintels: Conform to ASTM A36-91, size and bearing as shown on the Drawings.

B. Reinforcing Steel: Steel deformed bars (except No. 2 bars and sleeved dowel bars) per ASTM A615-89, including Supplementary Requirements S1, Grade 40, for #3 and smaller bars, ties and stirrups, Grade 60 for all other, free from rust, scale, oil, and frost.
   1. Epoxy coated reinforcing steel per ASTM D3963-86 having a light colored powdered epoxy resin which will highlight rusting of untreated bar areas.

2.4 MASONRY ACCESSORIES

A. Horizontal Reinforcing: Standard truss or ladder fabricated from 9 gage cold-drawn steel wire conforming to ASTM A82-90a, with deformed continuous side rods and plain cross-rods. Hot-dipped galvanized after fabrication per ACI 531R-79, coating requirements. Use prefabricated corners and tee sections at all building corners and intersections. Provide with one longitudinal side rod for each bed joint. Provide overall width approximately 1.5" to 2" less than the thickness of wall. Manufactured by Dur-O-Wal, Inc., Arlington Height, IL, or approved equal.

B. Reinforcing Bar Positioners: D/A 810, 9 gage wire with mill galvanized finish, sizes to fit masonry unit as manufactured by Dur-O-Wal, Inc., or approved equal.

2.5 CLEANING MATERIALS: ProSoCo, Kansas City, KS, Sure-Klean 600, 101, or Vana Trol, or approved equal, as suited to surfaces and conditions and other types as recommended and necessary to clean particular stains or surfaces. Use "Heavy Duty Concrete Cleaner" or approved equal for natural colored CMU.

2.6 MORTAR AND GROUT MATERIALS

A. Portland Cement: Type I, except Type III may be used for cold weather construction. Provide low alkali, portland cement conforming to ASTM C150-92. Masonry cements or plastic cements are not permitted. Provide white portland cement meeting same requirements where called for. Do not use fly ash. Maximum percentage of alkali shall be as specified in Table 1A of ASTM C150-92 for low alkali cement.

B. Hydrated Lime: For masonry purposes - Type S conforming to ASTM C207-91 (1992).

C. Sand: ASTM C144-91.

D. Grout Aggregates: ASTM C404-93, size 1 for fine aggregate, size 8 or 89 for coarse.

E. Water: Clear potable water.

PART 3 EXECUTION

3.1 ERECTION

A. Built-in Members:
1. Ascertain from various trades and coordinate where all chases or opening for vents, pipes, wires, ducts, etc., are to go and construct all such chases as shown or required.
2. Build in all anchors, bolts, flashing, wall plugs, nailing strips, beams, etc., as may be required. Place these materials according to directions of those who furnish them.
3. Coordinate with electrical trades so outlets are centered on or aligned with masonry joints in exposed work.
4. Fully grout steel door frames set into masonry as wall is being built.

B. Bond:
1. Lay all masonry in running bond unless otherwise shown on the Drawings.
2. Lay all masonry so that only finished faces are exposed to view.

C. Joining of Work:
1. Where fresh masonry joins masonry that is partially set, clean and lightly wet the exposed surface of the set masonry so as to obtain the best possible bond with the new work. Remove all loose masonry and mortar.
2. When it becomes necessary to "stop off" a horizontal run of masonry, rake back in each course and, if grout is used, stop the grout 4 inches back of the rake. Toothing is not permitted for joining new work.
3. The foundation surface which is to receive masonry shall be clean and damp, and all laitance shall be removed.
4. In grouted construction when grouting is stopped for 1 hour or longer, stop the grout pour 1-1/2" below the top of the last course.
5. Where joining new work to existing or repairing or finishing walls where selective demolition has exposed unfinished masonry or left a void in the masonry, remove existing surrounding masonry and tooth in new masonry to extent required so that all adjacent parallel and perpendicular masonry surfaces have continuous and unbroken, finished masonry appearance.

D. Joints:
1. All joints in masonry shall be slightly concave, almost flush, tooled with an approved jointer.
2. Steel jointers may be used except that stainless steel jointers shall be used where white or a light colored mortar is used.
3. The use of a minimum 16" long sled runner is required at horizontal joints.
4. Fill joints in masonry work and joints between masonry work and other material required in connection therewith, with mortar as each course is laid. All bed and head joints shall

be solidly filled with mortar. The thickness of mortar joints shall be uniform and true to dimensions, consistent with masonry unit dimensional tolerances.

5. Joints that will remain concealed may be struck flush.

E. Laying:

1. Lay all masonry unit plumb and true to lines with completely filled head and bed joints. Furrowing of bed joints is not permitted. Closures shall be rocked into place with the head joint mortar thrown against the two adjacent units in place. All masonry shall be shoved at least ½-inch into place.
2. Prevent grout or mortar from staining the face of masonry to be left exposed. If grout or mortar does contact the face of such masonry, remove immediately. Protect adjacent construction from damage during construction.
3. Keep cavity or air space and face of masonry free of mortar droppings.

F. Tolerances for Construction:

1. Variation from the plumb in the lines and surfaces of columns, walls and arises shall not exceed 1/4" in 10', 3/8" in a story height of 20' maximum. Variation from plumb for external corners, expansion joints and other conspicuous lines, shall not exceed 1/4" in any story or 20' maximum.
2. Variation from the level of the grades indicated on the Drawings for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines shall not exceed 1/4" in any bay or 20', nor ½" in 40' or more.
3. Variation of the linear building line from its established position in plan and related portion of columns, walls and partition shall not exceed ½" in any bay or 20' maximum, nor 3/4" in 40' or more.
4. Variation in cross-sectional dimensions of columns and thickness of walls shall not exceed minus 1/4", nor plus ½" from the dimensions indicated on the Drawings.

G. Reinforcement:

1. General: Refer to Drawings for principal horizontal and vertical reinforcing. All reinforcement shall be continuous. Use continuous horizontal joint reinforcement in multi-wythe construction for bond tie between wythes unless noted otherwise on the Drawings.
2. Reinforcement Bars: Accurately position and secure against displacement from the location shown on the Drawings. In splicing vertical reinforcement, or attaching to dowels, the bars shall be placed in contact and wired. Provide 36 bar diameter lap splices. Horizontal reinforcement may be placed as the work progresses. Use bar positioners for vertical reinforcing bars. Locate positioners at top of first masonry course, 1 course below the top of the wall and a minimum of 192 bar diameters in between.
3. Horizontal Reinforcement: Installed in the first and second bed joints immediately above lintels and below sills at openings, and in bed joints at 16" vertical intervals elsewhere.

Extend joint reinforcement a minimum of 24" past edge of opening except where control joints occur adjacent to openings. All other reinforcement shall be continuous except that it shall not pass through vertical masonry control joints, except where so noted on Drawings. Side rods shall be lapped at least 6" at splices. Reinforcement shall be so placed as to ensure a 5/8" mortar cover measured from outside face of mortar joint at faces exposed to exterior and not less than ½" elsewhere. Use prefabricated corners at wall intersections and pilasters.

H. Grouting:
1. General:
   a. Grout spaces less than 2" in width using fine grout. Grout spaces greater than 2" in width using coarse grout.
   b. Grout lifts shall not exceed 6 times the width of the grout space, with a maximum of 48 inches high. Use low-lift grouting techniques.
2. Placement: Place as indicated on Drawings. Where not otherwise indicated, provide 1-#5 vertical each side of each opening with a 2 ft. minimum extension past sill and head, and 1-#5 vertical full height at all unsupported edges and each side of each control and/or expansion joint.
3. Construct with vertical alignment of cells and other spaces to be grouted to provide continuous unobstructed openings.
4. Mortar in bed joints shall be struck flush to faces of masonry unit adjacent to grout spaces. Keep mortar droppings out of grout space.
5. Use a mechanical vibrator when grouting to ensure proper consolidation of the grout in cells. Reconsolidate grout after water absorption into masonry units.
6. When the grouting is stopped for one hour or longer, stop pouring of grout 1-1/2" below the top of the uppermost unit.

I. Curing: At least 12 hours shall elapse after building masonry columns or walls before uniform floor or roof loading is applied, and 3 days shall elapse before applying a concentrated load, such as a truss or girder.

3.2 CLEANING

A. Preparation: Point all holes in exposed masonry, and cut out and repoint defective joints.

B. Protection: Provide coverings and masking to protect plant materials and other non-masonry surfaces from damage due to cleaning operations.

C. Environmental Conditions: Ambient and substrate temperature must be above 40° F, water must be heated to a minimum of 120° and a maximum of 200° to achieve acceptable cleaning environmental conditions.

D. Test: Test cleaning methods on sample wall panel; leave ½ panel uncleaned for comparison purposes. Test separate samples of adjacent materials with full strength cleaning materials. Obtain Contracting Officer's approval of sample cleaning before proceeding with cleaning of masonry.

E. Clean all exposed unglazed masonry on which no green efflorescence appears. Clean exposed masonry surfaces after mortar and grout is fully cured and as recommended by BIA "Technical Notes 20 Revised". Use cleaning materials specified and in accordance with manufacturer's recommendations.

F. Thoroughly wet with clear water prior to application of cleaners. Apply cleaners immediately and scrub with fiber brushes to remove excess mortar and stains; remove cleaners promptly by rinsing thoroughly with clear water. Use bucket and brush hand cleaning method. Do not use muriatic acid.
   1. Pre-wetting and rinsing require application of not less than full available water pressure with pressure application at 400 psi preferred.
   2. Do not use high pressure spray for application of cleaning solutions. Apply with bucket and brush or spray at pressure less than 50 psi.
   3. Take special care to avoid discoloration of colored mortars.

G. Clean and protect glazed surfaces as recommended by the manufacturer. Marred or damaged glazed faces is cause for rejection.

3.3 CLEAN UP

A. Remove all debris and excess material resulting from the work and legally dispose of it.

B. As masonry work progresses, keep clean with burlap or brush and at completion thoroughly clean all masonry work.

C. Protect all adjacent surfaces susceptible to damage due to masonry installation. Thoroughly clean these surfaces upon completion of masonry work to render to new condition.

PART 4 COST

4.01 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically

identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of furnishing and installing structural steel. All structural steel shall be painted unless shown or specified otherwise.

B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.

C. Related Work:
1. Section 03301: Structural Concrete.
2. Section 05500: Metal Fabrications.
3. Section 09900: Painting.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
1. AISC "Code of Standard Practice for Steel Buildings and Bridges, 1986".
2. AISC "Specifications for Structural Joints using ASTM A 325-89 or A 490-89 Bolts, 1985" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
3. ANSI/AWS D1.1-88 "Structural Welding Code".
4. ASTM A 36/A-89 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use".
5. AISC "Specifications for the Design of Cold-Formed Steel Structural Members".
6. Steel Deck Institute "Specifications and Commentary for Steel Roof Deck".

B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".
1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
2. If recertification of welders is required, retesting will be Contractor's responsibility.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Sections 01300 and 01400.

B. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products.
   1. High-strength bolts (each type), including nuts and washers.
   2. Shrinkage-resistant grout.

C. Shop Drawings: Submit shop drawings sealed by a Registered Professional Engineer prior to fabrication. Include information necessary for fabrication of component parts of structure. Indicate size and weight of members, type and location of shop and field connections, type, size, and extent of all welds, and welding sequence. Use AWS welding symbols. Approval of shop drawings will be for size and arrangement of principal and auxiliary members and strength of connections. Any errors in dimensions shown will be the responsibility of the Contractor.
   1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld.
   2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.
   3. Include details for finish of each member and component.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time so as not to delay work.

C. Store materials to allow easy access for inspection and identification. Keep steel members off the ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If paint finish is damaged, repair in accordance with these specifications.
   1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

B. Structural Steel Shapes, Plates and Bars: ASTM A 36.

C. Stainless Steel Shapes, Plates and Bars: ASTM A276 - where shown in Drawings.

D. Stainless Steel Pipe: ASTM A312-79A.

E. Stainless Steel Fittings: ASTM A403-79.

F. Anchor Bolts: ASTM A449.

G. Unfinished Threaded Fasteners: ASTM A307-89.

H. Provide hexagonal heads and nuts for all connections, stainless steel or cadmium plated to match bolt material.

I. Roof Deck: ASTM A466, Grade A, galvanized (G-90 coating).

2.2 HIGH-STRENGTH THREADED FASTENERS

A. Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows: Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A 325-89.

2.3 ELECTRODES FOR WELDING

A. E-60XX low hydrogen, in compliance with AWS Code. Use stainless steel electrodes to weld stainless steel members.

2.4 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final Shop Drawings.

B. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

C. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

D. Connections: Weld or bolt shop connections, as indicated on Drawings.
   1. Bolt field connections, except where welded connections or other connections are indicated.
   2. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.

E. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

F. Finishing:
   1. Shop paint structural steel work, except those members or portions of members to be embedded in concrete or mortar.
   2. Paint embedded steel which is partially exposed on the exposed portions, and the initial 2" of embedded areas only.
   3. Do not paint surfaces which are to be welded or high strength bolted with friction type connections.
   4. Apply two coats of paint to surface which are inaccessible after assembly or erection. Change color of the second coat to distinguish it from the first.

G. Surface Preparation:
   1. After inspection and before shipping, clean steelwork to be painted.
   2. Remove loose rust, loose mill scale, and spatter, slag, and flux deposits.
   3. Clean steel in accordance with Steel Structures Painting Council SP-3, 1982, "Power Tool Cleaning".

H. Painting:
   1. Immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer's recommendations and at a rate to provide a uniform dry film thickness.
   2. Use painting methods which will result in full coverage of joints, corners, edges, and exposed surfaces.
   3. Paint in accordance with Section 09900.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions under which structural steel work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 ERECTION

A. Comply with the AISC Specifications and Code of Standard Practice as herein specified. Maintain work in a safe and stable condition during erection.

B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
   1. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.

D. Setting Bases and Bearing Plates: Clean concrete bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.
   1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
   2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
   3. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

E. Holes may be punched, subpunched, reamed or drilled. Field torched holes will not be allowed.

3.3 QUALITY CONTROL

A. Shop Bolted Connections: Inspect in accordance with AISC specifications.

B. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:
   1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   2. Perform visual inspection of all welds.

C. Field Bolted Connections: Inspect in accordance with AISC specifications.

D. Field Welding: Inspect and test during erection of structural steel as follows:

   1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   2. Perform visual inspection of all welds.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Provide steel joists as shown on the drawings with basic layout and type of joist required. Include bridging, anchors, extended ends, anchorage and accessories required for a complete installation.

B. Related requirements.
   1. Section 05120: Structural Steel.
   2. Section 05300: Metal Decking.

1.2 SUBMITTALS

A. Submit detailed shop drawings showing layout of joist units, special connections, jointing and accessories. Include the mark, number, type, location and spacing of joists and bridging. Provide templates or location drawings for installation of anchor bolts.

B. Submit copies of welder's certification on request.

1.3 QUALITY ASSURANCE

A. Shop welding at the fabrication plant is the responsibility of the manufacturer's quality control.

B. Qualify welding processes and welding operators in accordance with the AWS "Standard Qualification Procedure".

C. Steel Joist Institute "Specifications".

D. As required in Section 05120; Structural Steel

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI "Specifications" and ASTM A36.

B. Fasteners: Unfinished threaded fasteners: ASTM A307, Grade A, regular hexagon type, low carbon steel.

C. Steel prime paint: Comply with SJI "Specifications".

D. Bedding mortar: For joist ends bearing on concrete or masonry, provide bedding mortar specified in Section 04200.

2.2 FABRICATION

A. Fabricate steel joists and units in accordance with SJI "Specifications". Provide units conforming to SJI Series K.

B. Bridging: Provide horizontal or diagonal type bridging for "open web" joists, complying with SJI "Specifications".

PART 3 EXECUTION

3.1 EXECUTION

A. Place and secure steel joist units in accordance with SJI "Specifications", final shop drawings, and as herein specified. Locate bearing plate 1" from face of masonry on joist side of wall.

B. Anchors: Furnish anchor bolts and other devices to be built into the masonry construction.

C. Placing joists: Do not start placement of units until supporting work is in place and secured. Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening. Provide temporary bridging, connections, and anchors to ensure lateral stability during construction.

D. Bridging: Install bridging simultaneously with joist erection, before any construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.

E. Fastening Joists: Field weld joist units to supporting steel beams or cast in bearing plates in accordance with SJI "Specifications" for the type of joist used. Coordinate welding sequence and procedure with the placing of joists.
   1. Weld all joints to cast-in bearing plates with a minimum of 1/4" fillet weld 2" long, each side.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Provide and install metal decking shown on the Drawings and specified herein.

B. Related requirements.
   1. Section 05120: Structural Steel.
   2. Section 05210: Steel Joists.

1.2 QUALITY ASSURANCE

A. Comply with provisions of AISI "Specification for the Design of Cold-Formed Steel Structural Members", AWS "Structural Welding Code" and SDI "Design Manual for Composite Decks, Form Decks and Roof Decks", Publication No. 25.

B. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".

C. As required in Section 05120: Structural Steel.

1.3 SUBMITTALS

A. Submit detailed shop drawings showing layout and types of deck panels, anchorage details and conditions requiring cut openings, special jointing or other accessories.

B. Submit copies of welder's certifications on request.

PART 2 PRODUCTS

2.1 MATERIALS

A. Metal deck: Noncomponent deck conforming to the following criteria:
   1. Maximum Flexural Working Stress: 20,000 psi.
   2. Maximum deflection: L/240.

3. See Drawings for deck type and gage.

B. Accessories:
   1. Threaded fasteners: Self-drilling/tapping plated steel hexagonal slotted head screws, Rawlplug Co., Inc., "TEKS" or equivalent, No. 12 size, unless otherwise indicated.

C. Painted finish: Manufacturer's standard, baked-on rust inhibitive, applied to chemically cleaned, phosphate coated surface.

2.2 FABRICATION

A. Form deck units in lengths to span 3 or more supports with flush, telescoped or nested 2" laps at ends and interlocking or nested side laps, unless otherwise indicated.

B. Provide deck in 30" or 36" wide units conforming to specified section property criteria.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.

B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.

C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.

D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

E. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

F. Do not use deck units for storage or working platforms until permanently secured.

G. Cutting and fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown on the drawings.

3.3 FASTENING DECK UNITS

A. See drawings for deck attachment.

B. Comply with AWS requirements and procedures for manual shielded metal arc welding, the appearance and quality of welds, and the methods used in correct welding work. Use welding washers where recommended by deck manufacturer.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section consists of furnishing and installing all steel shapes, cast iron materials, metal accessories and factory fabricated metal and iron products which are not a part of the structural steel or other metal systems are included in this section. Such miscellaneous items that are not defined herein but are shown on the Drawings shall also be furnished and installed.

1.2 RELATED WORK

A. Section 03301: Concrete.

B. Section 05120: Steel.

C. Section 06114: Wood Blocking and Curbing.

1.3 QUALITY ASSURANCE

A. Codes and Standards:
1. AISC "Specifications for the Design, Fabrication of Structural Steel for Buildings," and including "Commentary of the AISC Specifications-1989".
2. AWS "Code for Welding in Building Construction-1988".
3. ASTM A6-92 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use".

B. AISC Qualification for Welding Work: Qualify welding processes and welding operations in accordance with AWS "Standard Qualification Procedure-1988".

C. Field Measurements: Take field measurements prior to fabrication to ensure proper fitting of the work. Allow for trimming and fitting wherever the taking of field measurements before fabrication might delay the work.

1.4 SUBMITTALS: As specified in Section 01330.

A. Product Data: Submit data for products used in miscellaneous metal fabrications, including manufactured railing or stair systems, paint, railing wall brackets and other similar manufactured items.

B. Shop Drawings: Submit shop drawings detailing fabrication and erection of each metal fabrication indicated. Include planes, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 PRODUCTS

2.1 STEEL MATERIALS

A. General:
1. Material shall be the same as specified for structural steel by the AISC Specification.
2. The as-fabricated straightness tolerances of members not to exceed one-half of the standard camber and sweep tolerances in ASTM A6-92.
3. Specific tolerances on the Drawings shall take precedence over Specifications.
4. For the fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, prior to cleaning, treating and application of surface finish including zinc coatings.

B. Structural Steel Plates, Shapes and Bars:
1. Shapes and Plates (except Plates to be bent or Cold Formed): ASTM A36-91.
2. Steel Plates to be bent or Cold-Formed: ASTM A283-92, Grade C.
3. Steel Bars and Bar-Size Shapes: ASTM A675-90a, Grade 65, or ASTM A36-91.
4. Steel Tubing: Cold-Formed: ASTM A500-90a, Grade A.
5. Steel Pipe: ASTM A501-90; black finish, type f, standard weight, schedule 40, unless otherwise indicated.
6. Uncoated Structural Steel Sheet: Cold-Rolled; ASTM A611-92, Grade A, unless otherwise indicated or required by design loading.
7. Uncoated Steel Sheet: Commercial quality, Cold-Rolled; ASTM A366-91.
8. Galvanized Steel Sheet: Structural Quality; ASTM A466-91, Grade A, unless otherwise required by design loading.

C. Fasteners: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for type, grade, and class required.
1. Bolts and Nuts: Regular hexagon head type, ASTM A307-92a, Grade A.
2. Lag Bolts: Square head type, FS FF-B-561.
3. Toggle Bolts: Tumble-wing type, FS FF-B-588.
4. Drilled-in Expansion Anchors: Expansion anchors: FS FF-S-325, Group VIII, Type 1. Machine Bolts: FS FF-B-575, Grade 5.
5. Machine Screws: Cadmium plated steel, FS FF-S-92.
6. Plain Washers: Round, carbon steel, FS-FF-W-92.
7. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

2.2 PAINT

A. Metal Primer Paint: Provide fast curing, lead free, universal modified alkyd primer, complying with performance requirements of FS TT-P-645. Provide primer that is compatible with finish paint systems specified in Section 09900.

B. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94% zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.

C. Bituminous Paint: Cold applied asphalt mastic, containing no asbestos, and complying with SSPC-Paint 12.

2.3 GROUT

A. Nonshrink Nonmetallic Grout: Pre-mixed, factory packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD-C 621. Provide as recommended by manufacturer for interior or exterior use.

B. Anchoring Cement: Factory prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement. Provide product formulated for exterior use to resist erosion from water exposure without need for waterproofing coating. "Ankertite Cement" as manufactured by Dayton Superior, Seattle, WA, or approved equal.

2.4 FABRICATION - GENERAL

A. General:
1. Clean and free of mill scale, flake rust and rust pitting.
2. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product.
3. Fabricate to dimensions shown or accepted on the shop drawings, using proven details of fabrication and support.
4. Fabricate exposed work true to line and level with accurate angles and smooth surfaces and straight sharp edges.
5. Connections: Weld corners and seams connections continuously, comply with AWS recommendations. At exposed welds grind flush and smooth to match and blend with adjoining surfaces. Do not use screws or bolts where it can be avoided. Where used, provide phillips flat head (countersunk) screw or bolt. Secure nut or bolt head tightly and nick threads to prevent loosening.
6. Edges: Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing the work.

7. Fabricate joints which when exposed to weather will exclude water. Provide weep holes where water can accumulate.

B. Castings: Uniform quality, free from flowholes, porosity, hard spots, shrinkage distortion or other defects. Castings: smooth and well cleaned by shot blasting. Machined horizontal bearing surfaces and covers subject to street or foot traffic and as indicated.

C. Connections: Welded unless otherwise indicated. Exposed welds shall be continuous and ground to smooth even finish.

D. Finishes:
1. General: Comply with NAAMM "Metal Finishes Manual-1977" for recommendations relative to application and designations of finishes.
2. Galvanized Finish: Provide a hot-dipped zinc coating for those items shown or specified to be galvanized, as follows:
   a. Iron and steel hardware: ASTM A153-82 (1987).
   b. Iron and steel products made from rolled, pressed, for forges steel shapes, casting, plates, bars and strips: ASTM A123-89a.
   c. Assembled steel products: ASTM A123-89a.
3. Shop Primer Paint Finish: Shop paint miscellaneous ferrous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.
   a. Preparation: Follow procedures for preparation and painting published by SSPC PA1.
      1) Exterior items: SSPC SP-6, "Commercial Blast Cleaning".
      2) Exterior items: SSPC SP-7, "Brush-off Blast Cleaning".
   b. Painting: provide dry paint film thickness of 2 mils minimum. Spray apply paint to items exposed to view. Provide one shop coat of primer except that provide an additional coat where surfaces will be inaccessible after erection.

2.5 LOOSE STEEL LINTELS

A. Fabricate loose structural steel lintels from steel angles for openings and recesses in masonry walls and partitions. In general lintels on the drawings are shown for primary openings and recesses. Where lintels are not shown, but necessary, provide lintels per the loose lintel schedule on the drawings.

2.6 STEEL PIPE GUARDRAILS, HANDRAILS AND SUPPORTS

A. Fabricate to designs, dimensions, details and patters as shown on the Drawings and to conform to applicable codes and as required to support structural loads. Fabricate to meet

requirements of ASTM E985-87. Galvanize all steel pipe and components at exterior locations.

1. Square or Angled Intersections: Cut, miter and weld joints. Fill, grind and smooth. Interconnect railing and handrail members by butt welding or welding with internal connectors. At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.
2. Radius Intersections: Provide where shown on the Drawings. Additionally provide radius returns at ends of wall mounted handrails.
   a. Small Radius: Provide prefabricated radius fittings for all small radius intersections.
   b. Large Radius: Form simple and compound curves by bending pipe in jigs to produce uniform curvature. Maintain cylindrical cross section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
3. Ends: Close ends of pipes by welding 3/16" thick steel plate in place or use prefabricated fittings.
4. Anchors and Supports:
   a. Wall Supports: #306 or #1306 (Exposed Bolt) as manufactured by Julius Blum & Co., Inc., Carlstadt, NJ, or approved equal.
   b. Floor Posts Set in Concrete: Fabricate sleeves from steel pipe, 5" long, with an inside diameter of 1" greater than the outside diameter of the post, with steel plate closure welded to bottom of sleeve.

2.7 PIPE BOLLARDS: Fabricate from 6" Schedule 80 steel pipe, fill with concrete.

PART 3 EXECUTION

3.1 PREPARATION

A. Provide anchors, setting drawings, diagrams, templates, instructions, and directions for installation of anchors, concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of items to the site.

3.2 ERECTION

A. Fastening to In-Place Construction: Provide appropriate type and size of anchorage devices and fasteners where necessary for securing fabrications to in-place construction to support anticipated loads. Provide blocking and bracing within frame wall construction to support fabrications.

B. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of fabrications. Set accurately in location, alignment, and elevation. Set with edges and surfaces level, plumb, true, and free of rack.
   1. Maximum variation in straightness, elevation, plumb, level, line or true: 1/4" in 10'-0".

C. Bracing: Provide temporary bracing or anchors in formwork to items that are built into concert, masonry or similar construction.

D. Connections: Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units receiving hot-dip galvanizing after fabrication and are intended for bolted or screwed field connections.

E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work, and the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base materials.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

F. Touch Up: After erection, all damaged and abraded spots including any unpainted or galvanized areas, welds, etc., shall be touched up with one coat of Primer or Galvanizing Repair Paint.

3.3 INSTALLATION OF STEEL PIPE GUARDRAILS, HANDRAILS AND SUPPORTS

A. Support Anchors: Anchor posts in concrete by use of steel sleeve insert for new concrete or core drilling existing concrete.
   1. Set steel sleeve in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.
   2. Core drill holes not less than 5" deep and 3/4" greater than the outside diameter of the post.
   3. Clean sleeves or holes of loose material, insert posts, and fill annular space between post and concrete with anchor cement.

3.4 CLEAN UP

A. All work furnished and installed under this section shall be left undamaged, touched up and clean. Protect work until acceptance.

B. Collect and remove all debris and rubbish from the site and legally dispose of.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other terms for which payment is made. The Contractor shall include in his price bid an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fabricated metal material including handrails, guardrails, and custom fabricated metalwork.

B. Embedded and nonembedded metal material including metal inserts for concrete, loose steel lintels, shelf angles, bars, channels, and plates not attached to structural steel, and not including metalwork which is specified in other paragraphs.

C. Frames, hangers, and supports required for equipment except those which are specified in other paragraphs.

1.2 REFERENCES

A. AISC "Specifications for Design, Fabrication, and Erection of Structural Steel for Buildings".

B. AWS Code D1.1, "Structural Welding".

C. UBC requirements for railings, stairs, and ladders.

PART 2 MATERIALS AND PRODUCTS

2.1 MATERIALS

A. Steel Sections, Including Bars, Angles, and Plates: ASTM A galvanizing, where required, shall be in accordance with ASTM A 123.

B. Steel Plates To Be Bent or Cold-Formed: ASTM A 283, Grade C (minimum yield point of 30,000 psi).

C. Steel Tubing: ASTM A 500, (cold-formed structural quality, welded, or seamless), Grade A (minimum yield strength of 33,000 psi), black finish. ASTM A 501 (hot-formed structural quality, welded or seamless), minimum yield strength of 36,000 psi. Galvanizing, where required, shall be in accordance with ASTM A 53.

D. Steel Pipe: ASTM A 53; type as selected, Grade A (minimum yield strength of 30,000 psi); black finish unless galvanizing is required; standard weight (Schedule 40), unless otherwise indicated.

E. Galvanized Steel Sheets: ASTM A 526/A 526M/85 (commercial quality) with G 90 zinc coating.

F. Steel Floor Plate: 1/4" steel raised four way pattern.

G. Welding Material: AWS D1.1-88 with type required for material being welded.

H. Arc-Welding Electrodes: In accordance with AWS "Specifications for Iron and Steel Arc-Welding Electrodes" and suitable for base material, positions, and other conditions of intended use.

I. Metal Inserts for Concrete: Suitable for use with and provide spring-type T-bolt or spring nut and bolt of 3/4-inch diameter; for hanging and supporting material and equipment, with anchors and end caps; and equal to:
   1. Kindorf Continuous-Slot Channel Concrete Inserts and Connectors by F.L. Industries, Inc., American Electric Division, 1555 Lynnfield Road, Suite 250, Memphis, TN 38119.
   2. Concrete Insert 4W120 and Connectors by Mult-A-Frame Corp., P.O. Box 658, Pontiac, MI 48056.
   3. Unistrut P-3200 Concrete Inserts and Connectors by Unistrut Corp., 777 East Eisenhower Parkway, Suite 600, Ann Arbor, MI 48108.

J. Fasteners, General: Galvanized for exterior use and where built into exterior walls.

K. High-Strength Bolts, Nuts, and Washers: ASTM A 325 and ASTM A 490.

L. Bolts, Nuts, and Washers: ASTM A 307, Grade A.

M. Machine Screws: ASME A 545.

N. Wood Screws: ASTM A 549, flat head carbon steel.

O. Headed Studbolts, Stud Anchors, and Deformed Bar Anchors: Of design suitable for arc welding to steel with automatically timed stud-welding equipment.

P. Anchor Bolts and Bolts for Anchors: ASTM A 307.

Q. Nuts: ASTM A 563, Grade A.

R. Expansion Anchors: Equal to:
1. Galvanized Wedge Anchors by ITW Ramset/Red Head, 2100 Golf Road, Rolling Meadows, IL 60008.
2. Hilti Fastening Systems, P.O. Box 21148, Tulsa, OK 74121.

S. Anchor Devices: Power-driven or powder-actuated, drilled expansion bolts; or screws with sleeves; approximately 1 inch long; and equal to fasteners by:
1. ITW Ramset/Red Head, 2100 Golf Road, Rolling Meadows, IL 60008.
2. Fixrammer Corp., 1401 Metals Drive, Charlotte, NC 28213.

2.2 FABRICATION

A. General: For fabrication of metalwork which will be exposed to view, use only material which is smooth and free of surface blemishes including pitting, seam marks, weld splatter, roller marks, rolled trade names, and roughness.

B. Dimensions: Verify dimensions on site prior to shop fabrication.

C. Joints: Fabricate material with joints tightly fitted and secured, flush, and hairline. Miter corners.

D. Assembly: Fit and assemble in largest practical sections for delivery to work site.

E. Grinding: Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small, uniform radius.

F. Anchorage: Provide components required for anchorage of metalwork. Fabricate anchors and related components of same material and finish as metalwork, except where specifically noted otherwise.

G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; and consistent with design of structure, except where specifically noted otherwise.

H. Handrails and Guardrails: Accurately form components required for anchorage of railings to each other and to building or stair structure.

I. Miscellaneous Framing and Supports: Fabricate as required to complete work. Fabricate to sizes, shapes, and profiles required to receive adjacent work which is to be retained by framing. Use structural shapes, plates, and bars of welded construction. Miter joints. Cut, drill, and tap material to receive hardware and similar material. Provide with stud anchors for casting into concrete or embedding into masonry as required. Provide anchor devices if

frames will be installed after concrete is placed. Anchor frames at a maximum of 24 inches on center with at least one anchor per side.

J. Miscellaneous Steel Trim: Fabricate shapes and sizes as shown on the drawings. Fabricate from structural shapes, plates, and bars of welded construction. Use concealed field splices. Provide cutouts, fittings, and anchors as required for coordination of assembly and installation with other work. Galvanize exterior miscellaneous trim.

K. Finish: Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

L. Prime Finish: Do not prime surfaces in direct contact bond with concrete or where field welding is required. Prime paint unfinished metalwork with two coats rust-inhibitive primer.

PART 3 EXECUTION

3.1 PREPARATION

A. Cleaning: Clean and strip primed steel material to bare metal where welding is required.

B. Temporary Bracing: Provide for erection loads with temporary bracing. Keep work in alignment.

C. Setting Templates: Furnish material to be cast into concrete or embedded in masonry with setting templates.

3.2 INSTALLATION

A. General: Install material plumb and level, accurately fitted, and free from distortion or defects. Perform cutting, drilling, tapping, and fitting required for installation of metalwork. Fit exposed connections accurately to form tight hairline joints.

B. Welding: Perform field welding in accordance with AWS D1.1. Grind exposed joints smooth and flush.

C. Fastening to In-Place Construction: Set anchor devices and fasteners where necessary to secure metalwork to in-place construction. Use threaded fasteners, masonry anchors, toggle bolts, through bolts, lag bolts, wood screws, and other connectors as required.

D. Stairs: Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure. Verify alignment with adjacent construction. Coordinate related work. Field bolt

and weld to match standard of shop bolting and welding. Hide bolts and screws whenever possible. Where not hidden, use flush countersunk fastenings. Mechanically fasten joints butted tight, flush, and hairline. Field cutting or altering members is not permitted.

E. Handrails and Guardrails: Anchor handrailings to concrete.

F. Gratings: Install grates in accordance with manufacturer's instructions. Mechanically cut galvanized finished surfaces. Do not use flame cutting tools. Secure grating with mechanical fasteners to prevent movement.

G. Manufactured Material: Install in accordance with manufacturer's instructions.

H. Painting: In accordance with the "Painting" section.

3.3 SCHEDULE

A. Stair Gratings: Galvanized.

B. Handrails and Guardrails: Prime paint and finish paint.

C. Ledge Angles Above Grade and Channels and Plates Not Attached to Structural Framing, for Support of Steel Deck Masonry: galvanized finish.

D. Lintels: Prime paint finish. Finish paint at exposed lintels.

E. Manufactured Material: Manufacturer's finish.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other terms for which payment is made. The Contractor shall include in his price bid an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Parapet wall cap and roof perimeter nailers.

B. Telephone and electrical panel backboards.

1.2 REFERENCES

A. AWPA (American Wood Preservers Association) C1 - All Timber Products Preservative Treatment by Pressure Process.

B. WWPA (Western Wood Products Association).

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by ALSC.

PART 2 PRODUCTS

2.1 MATERIALS

A. Lumber Grading Rules: WWPA.

B. Miscellaneous Framing: Stress Group D, Hem Fir species, 19 percent maximum moisture content, pressure preservative treat.

C. Telephone and Electrical Panel Backboards: 5/8 inch interior grade plywood; A-B INT-APA.

2.2 ACCESSORIES

A. Fasteners and Anchors:
   1. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
   2. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

2.3 FACTORY WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA Treatment C1 using water borne preservative with 0.25 percent retainage.

B. Wood Preservative (Surface Application): Compatible with shop treatment.

PART 3 EXECUTION

3.1 FRAMING

A. Set members level and plumb, in correct position.

B. Place horizontal members, crown side up.

C. Countersink fasteners so they do not project into the roof membrane or parapet wall coping.

3.2 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply two coats of preservative treatment to all sawn ends of lumber.

C. Allow preservative to dry prior to erecting members.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A, Water repellent coating applied to exterior masonry surfaces which are not painted.

1.2 RELATED SECTIONS

A. Section 04200: Unit Masonry.

1.3 REFERENCES

A FS SS-W-110 - Water Repellent, Colorless Silicone, Resin Base.

1.4 SYSTEM DESCRIPTION

A. Applied Penetrant: To exhibit an ability to restrict 1 percent maximum moisture absorption in material being treated.

1.5 DELIVERY, STORAGE, AND PROTECTION

A. Protect liquid coating from freezing.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not apply coating when ambient temperature is lower than 10 degrees C or higher than 38 degrees C.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Thoro System Products.
   2. Rexnord Chemical Products.

2.2 MATERIALS

A. Coating: Water based Silane, colorless equal to Enviroseal Double 7 for Block or Thoroclear 777.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify joint sealants are installed and cured.

B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of coating.

C. Verify that water repellent is compatible with roofing material and adhesives.

3.2 PREPARATION

A. Delay work until masonry mortar substrate is cured a minimum of 14 days.

B. Remove loose particles and foreign matter.

C. Remove oil or foreign substance with a chemical solvent which will not affect coating.

D. Scrub and rinse surfaces with water and let dry.

3.3 APPLICATION

A. Apply two coats to unpainted portions of the parapet wall in accordance with manufacturer's instructions. Water repellent may be applied with a roller or airless sprayer.

3.4 PROTECTION TO FINISHED AND ADJACENT WORK

A. Protect adjacent surfaces not scheduled to receive coating.

B. Protect property and vehicles.

C. If applied to unscheduled surfaces, remove immediately by a method instructed by coating manufacturer.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

SECTION 07212 BOARD AND LOOSE FILL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Rigid insulation for inside perimeter of foundation at exterior walls.

PART 2 MATERIALS

2.1 MANUFACTURERS

A. Board Insulation: Extruded polystyrene insulation board with continuous, closed cell structure; density of not less than 2 pounds per cubic foot; thermal conductivity not greater than 0.20 Btu per hour/square foot/F per inch at 75°F; maximum water vapor transmission rate of 0.6 per inch; and equal to Styrofoam SM brand insulation by Dow Chemical Company, 2020 DOW Center, Midland, MI 48674.

B. Adhesive: As recommended by the board insulation manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

A. Concrete surfaces shall be clean. Remove fins and projections to provide an even surface.

3.2 INSTALLATION

A. General: Install insulation in accordance with manufacturer's recommendations and these specifications. Cut and fit with saw, knife, or other tool to leave clean, square edges. Fit insulation tight against adjoining pieces and closely around penetrations and openings with no spaces greater than 1/8 inch.

B. Board Insulation: Secure insulation against the foundation until backfill has been placed. Leave no gaps or offsets at the joints and cut flush with the bottom of the floor slab.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Batt insulation in steel stud cavities and other locations as shown on drawings.

B. Mineral fireproofing insulation for top of interior CMU wall in shop/office building.

C. Loose fill vermiculite insulation for hollow cells of CMU walls.

PART 2 MATERIALS

2.1 MANUFACTURERS

A. Kraft faced batt insulation equal to Light Density Thermal Insulation by Owens-Corning Fiberglass Corp., Construction Product Group, Fiberglas Tower, Toledo, OH 43659, and having the following minimum features:
1. Standard Compliance with ASTM C 665-88, Type II, Class C.
2. Thickness: 3 ½ inches.
3. R Value: 13.
4. Kraft Vapor Retarder: Shall have a vapor transmission rating of 1 perm or less.

B. Mineral fireproofing insulation equal to Thermafiber Mineral Fireproofing by USG Corp./ USG Interior, Inc., 101 South Wacker Drive, Chicago, IL 60606-4385, and having the following minimum features:
1. Standard Compliance with ASTM C 665-88, Type I.
2. Thickness: As required to fill void at top of CMU wall.
3. Facing: None.
4. Flame/Fuel/Smoke Rating: 15/0/0 per ASTM E 84.

C. Loose fill vermiculite insulation conforming to ASTM C-516-80 or federal specifications HH-1-585C and shall be treated for water repellancy.

PART 3 EXECUTION

3.1 Preparation: Verify adjacent material is dry and ready to receive insulation. Verify mechanical and electrical services within walls have been installed and tested.

3.2 Faced Batt Insulation: Install insulation with vapor retarder facing warm side of building spaces. Friction fit insulation between steel studs. Tape and seal tears and cuts in vapor retarder. Maintain continuity of vapor retarder membrane.

3.3 Sealing Fire-Rated Penetrations: Seal around ducts, conduit, and other penetrations through barrier walls with silicone firestop sealant or mineral fireproofing insulation as required for a fire-rated assembly. Seal all voids. Inspect after curing and add sealant as required for tight seal. Remove damming material if made of other than fire-resistant material.

3.5 Mineral Fireproofing Insulation: Fill the void at the top of the CMU wall separating the shop and office. Butt ends and edges closely together.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Elastomeric sheet membrane (EPDM) roofing.

B. Rigid roof insulation.

C. Flexible flashing.

D. Adhesives and sealants.

E. Mechanical fasteners.

F. Wood nailers with preservative treatment.

1.2 QUALITY ASSURANCE

A. Installation of elastomeric sheet membrane roofing material shall be by a qualified roofer, approved by the roofing manufacturer. Upon completion of the installation, an inspection shall be conducted by a Technical Representative of the roofing manufacturer.

1.3 SUBMITTALS FOR REVIEW

A. Shop Drawings: Indicate roof drainage, flashing details, conditions of interface with other material, and spacing of mechanical fasteners.

B. Product Data: Include membrane composition, adhesives, sealants, flashing and insulation.

C. Warranty: Provide a 10-year manufacturer's warranty against leakage, including coverage of material and installation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery material in original unopened containers with proper labels. Store material in weather-protected environment and clear of ground and moisture. Protect roof insulation from direct sunlight exposure. Protect membrane from abrasion or puncture.

1.5 JOB CONDITIONS

A. Environmental Conditions: Apply roofing only when ambient temperature is within the range permitted by the roofing manufacturer.

B. Protection: Insulation shall not be left exposed overnight or during inclement weather. Provide adequate protection to prevent moisture from entering any roofing material or deck before and during installation.

C. Compatibility of Materials: Do not use oil base or bituminous base roofing cements with the EPDM membrane.

PART 2 MATERIALS

2.1 ROOF INSULATION: Three-inch rigid roof insulation and tapered insulation composed of closed cell polyisocyanurate foam bonded to fiber reinforced facers; manufacturered to conform to Federal Specifications HH-I-1972/2, Class 1 and ASTM C-1289.

2.2 INSULATION FASTENERS: As recommended by membrane manufacturer for steel deck.

2.3 MEMBRANE: Mechanically fastened EPDM membrane with the following characteristics:

A. Thickness: 60 mils.

B. Color: Black

C. Tensile Strength: ASTM D-412; 1300 psi.

D. Elongation: ASTM D-412; 300%.

E. Brittleness Temperature: ASTM D-746; -45° F.

F. Tear Resistance: ASTM D-624; 125 lbs/in.

G. Water Absorption: ASTM D-471; +8, -2%.

2.4 MEMBRANE FASTENERS: As recommended by membrane manufacturer for steel deck.

2.5 FLEXIBLE FLASHING: Same as membrane material.

2.6 EPDM INSIDE AND OUTSIDE CORNERS, ADHESIVE, SEAM TAPE, PRIMER AND CAULKING: As recommended by membrane manufacturer for compatible and weather tight roofing system.

2.7 WOOD NAILERS: As specified in Section 06114 Wood Blocking and Curbing.

2.8 SHEET METAL FLASHING AND COPING: As specified in Section 07620 Sheet Metal Flashing and Trim.

2.9 PREMOLDED PIPE BOOTS: Provide for plumbing vents through roof membrane.

PART 3 EXECUTION

3.1 PREPARATION: Verify deck is clean and smooth, free of depressions, and acceptable by membrane manufacturer.

3.2 ROOF INSULATION: Apply insulation perpendicular to the steel decking flutes. Stagger end joints. Secure insulation with approved mechanical fasteners to provide I-90 uplift resistance. Lay insulation to moderate contact without forcing joints. Cut insulation to fit neatly to perimeter parapets and around protrusions through roof. Sufficient slope to drains shall be maintained to prevent standing water.

3.3 MEMBRANE: Lay membrane perpendicular to the continuous joints of insulation and parallel to roof edge. Lap edges of membrane a minimum of 4 inches. Stagger end joints. Fasten edges of membrane in accordance with the manufacturer's installation instructions.

3.4 FLASHING: Install flashing as shown on the drawings and in accordance with the manufacturer's installation requirements for a weathertight roofing system.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal roofing, fascia, flashing and trim.

1.2 SUBMITTALS FOR REVIEW

A. Samples: Submit a sample kit showing the standard range of factory-applied finishes for color selection by the Contracting Officer.

1.3 PERFORMANCE

A. Leakage: Roofing installation shall be free from water leakage under all weather conditions for roof slope of 2:12.

B. Metal Panel Finish: No chalk in excess of seven units as measured in accordance with ASTM D 659. No fade or color change in excess of 6 NBS units when measured in accordance with ASTM D 2244.

C. Thermal Movement: Provide roof and accessories to accommodate thermal expansion and contraction for plus or minus 100°F temperature fluctuation.

PART 2 MATERIALS

2.1 MANUFACTURERS

A. Standing Seam Roofing: Equal to AEP-SPAN, 5100 East Grand Avenue, Dallas, TX 75226 and with the following features:
   1. Base Materials: 24-gauge galvanized sheet steel.
   2. Dimension: Batten spacing of 16 to 24 inches on center; height approximately 2 inches.
   3. Finish: Factory-applied fluoropolymer paint.
   4. Panel Length: Continuous at each plane.

2.2 MISCELLANEOUS MATERIALS

A. Anchor Clips, Cleats, and Starter Strips: Concealed minimum 24-gauge galvanized or aluminized sheet steel; compatible and interlocking with roofing material; provided by

roofing manufacturer; and allowing for positive uniform load of 40 psf minimum and negative uniform load of 25 psf minimum.

B. Trim Material and Flashings: Formed from same material, gauge, and finish as roofing material. Allow for roof panel expansion and contraction.

C. Fasteners: Concealed screw attachment suitable for fastening to metal deck; as recommended by roofing manufacturer; and corrosion resistant.

D. Underlayment: ASTM D 266, No.30 unperforated asphalt saturated roofing felt.

E. Sealant: As recommended by roofing panel manufacturer.

PART 3 EXECUTION

3.1 General: Execute work in accordance with manufacturer's instructions.

3.2 Underlayment: Apply felt underlayment in single layer, half-lapped over metal deck.

3.3 Joints: Lap, lock, cleat, seam, and seal all joints for weathertight installation.

3.4 Hem: Hem exposed edges on underside ½ inch; miter and seam corners.

3.5 Clips and Cleats: Spacing as recommended by roofing manufacturer.

3.6 Batten Seams: Provide one piece sealed batten covers at change of planes.

3.7 Detail Standards: Conform to the following details as shown in the SMACNA "Architectural Sheet Metal Manual":

A. Batten Seam Roofs: Plates 88, 89, 90.

B. Repairs: Repair or replace material which is loose, improperly fitted, or damaged.

C. Painting: Paint cut edges of roofing, fascia, flashing, and accessories with matching paint provided by roofing manufacturer. Touch up minor scratches.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Flashing, counterflashing, clips, masonry parapet wall coping, conductor heads and downspouts. Form from prefinished sheet metal matching the metal roofing panels.

1.2 PRODUCT HANDLING AND PROTECTION: Store in clean, dry area away from corrosive and staining material.

PART 2 MATERIALS

2.1 Sheet Steel: Same material as metal roofing panels, 24 gauge galvanized steel, prefinished by metal roofing manufacturer.

2.2 Fasteners or Clips: Galvanized steel, concealed hook strip or clip, 20 gauge minimum, and sized to suit application.

2.3 Downspouts, Hangers, and Accessories: Formed from 24 gauge galvanized steel matching metal roofing panels. Provide 4x4 downspouts and overflow openings for conductor heads.

2.4 Sealant: In accordance with Section 7900: Joint Sealers.

2.5 Adhesive: Exterior type, with temperature and moisture resistance.

2.6 Nails: Galvanized nails for exterior use and in contact with galvanized sheet steel. Select type for material and use required. Neoprene washers as required.

2.7 Screws: Cadmium plated in contact with galvanized sheet steel, with neoprene washers; standard commercial quality. Select screw type for material and use required.

2.8 Miscellaneous Fasteners: Standard commercial quality, noncorrosive metal, and suitable for material and use required.

2.9 FABRICATION

A. General: Form sections square, true, and accurate to size, free from distortion and other defects detrimental to appearance and performance.

B. Sections: Form sections in longest practical lengths. Make allowances for expansion at joints.

C. Seams: Shall be flat lock type, except corners. Fabricate corners minimum 18 inches x 18 inches, mitered, and sealed as one piece.

D. Hem: Exposed edges of flashings on underside ½ inch.

E. Scupper and Conductor Head: Fabricate in accordance with Figure 1-27A of the 5th edition of the SMACNA manual.

PART 3 EXECUTION

3.1 Preparation: Prior to installing flashing and sheet metal work, substrates shall be smooth and clean.

3.2 General: Install work watertight, without waves, warps, buckles, fastening stresses, or distortion; allowing for expansion and contraction; and in accordance with SMACNA Architectural Sheet Metal Manual.

3.3 Fastening: Secure flashings in place using concealed fasteners whenever possible. Provide cleats or clips as shown. Space cleats and clips maximum 2 feet on center. Secure continuous clips to substrate with fasteners spaced maximum 1 foot on center. Space other fasteners at maximum 2 feet on center.

3.4 Seams: Lock seams and end joints. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Securely seal joints and laps for full width of lap. Avoid dripping cement or mastic or staining the building.

3.5 Counterflashing: Counterflash mechanical and electrical items projecting through roof membrane.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost

of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Self-curbing, insulated acrylic dome skylights.

B. Sealers and fasteners.

1.2 SUBMITTAL FOR REVIEW

A. Manufacturer's product information identifying components, materials and finishes.

PART 2 MATERIALS

2.1 SELF-CURBING SKYLIGHTS

A. Units shall be self-flashing and provided with a sealed, double acrylic dome, and an insulated curb frame of 9 to 12 inches high. The curb shall have an integral condensate gutter and 1-inch fiberglass insulation between the aluminum faces. The acrylic dome shall be white. Size and number of skylights shall be as shown on the drawings.

2.2 MANUFACTURERS: Skylight by the following manufacturers meet these requirements.

A. Model TSF by American Skylights, 7451 Dogwood Park, Fort Worth, TX 76118.

B. Model TLA by Naturalite Skylight Systems, 750 Airport Road, Terrell, TX 75160.

C. High-Lite Skylights by Plasticrafts/Faulkner, 4504 E. Hillsborough Ave., Tampa, FL 33610.

PART 3 EXECUTION

3.1 PROTECTION: Protect skylight from damage during installation. Carefully clean inside and outside surfaces of acrylic dome after installation.

3.2 INSTALLATION: Skylights shall be isolated from the steel deck by a plastic sheet or by painting the underside of the curb flange with a bituminous paint. Provide fasteners and sealants as recommended by the skylight manufacturer.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sealants, firestop sealant and joint backing.

1.2 REFERENCES

A. ASTM C834 - Standard Specification for Latex Sealing Compounds.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants.

F. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.1 SEALANTS

A. Type S - General Purpose Exterior Sealant: Polyurethane or Polysulfide; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component. Standard color to match adjacent surface.
   1. Control, expansion, and soft joints in masonry.
   2. Joints between concrete and other materials.
   3. Joints between metal frames and other materials.
   4. Other exterior joints for which no other sealant is indicated.

B. Type S - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, non-drying, non-skinning, non-curing.
   1. Applications: Use for:

a. Concealed sealant bead in sheet metal work.
b. Concealed sealant bead in roofing overlaps.
c. Parapet wall cap.

C. Type S - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable.
1. Standard colors matching finished surfaces.
a. Interior wall and ceiling control joints.
b. Joints between door and window frames and wall surfaces.
c. Other interior joints for which no other type of sealant is indicated.

D. Type S - Bathtub/Tile Sealant: White silicone; ASTM C920, Uses M and A; single component, mildew resistant.
1. Applications: Use for:
a. Joints between plumbing fixtures and floor and wall surfaces.

E. Silicone Firestop Sealant: One component silicone elastomer meeting the conditions of ASTM E 814-94b.
1. Applications: Use for:
a. Penetrations through the interior CMU wall in the shop-office building.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D1056, sponge or expanded rubber; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Perform installation in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.

D. Install bond breaker where joint backing is not used.

G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

I. Tool joints concave.

J. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

3.4 CLEANING

A. Section 01700 - Contract Closeout: Cleaning installed work.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

A. Section 01700 - Contract Closeout: Protecting installed work.

B. Protect sealants until cured.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel swinging doors, door frames, and other accessory material where shown on the drawings.

1.2 SUBMITTALS FOR REVIEW.

A. Shop Drawings: Submit details of steel swinging doors, and door frames. Show sizes and locations of framing members and reinforcement; gauges of steel; anchors; location of door hardware; location, size, and thickness of hardware reinforcements; and other details covering fabrication.

1.3 PRODUCT HANDLING AND PROTECTION: Follow manufacturer's special storage and handling requirements.

1.4 QUALITY ASSURANCE: Labeled fire doors shall bear appropriate UL label or FM symbol of approval.

PART 2 MATERIALS

2.1 Exterior Steel Doors: SDI-100, Grade III (extra heavy duty), Model 1 (full flush construction), and 1 3/4 inch thick, 16 gauge, Class (door type) as shown on the drawings.

A. Insulation: Fill spaces within exterior doors with glass fibers having a minimum density of 1 ½ pounds per cubic foot or polystyrene having a minimum density of 1 pound per cubic foot.

2.2 Interior Steel Doors: SDI-100, Grade II (heavy duty), Model 1 (full flush construction), 1 3/4 inch thick, 18 gauge, Class (door type) as shown on the drawings.

A. Door Louvers: Where shown on the drawings, doors shall be provided with louvers. Louvers shall be sightproof, stationary, inserted louvers, and have free areas of not less than those shown in door schedule.

B. Fire Rating: Door No. 3 shall have a Class C fire rating.

2.3 Steel Door frames: Door frames shall be of types and sizes shown on the drawings and in accordance with requirements of SDI-100.

A. Fire Rated: Door frames for door No. 3, shall have a Class C fire rating.

B. Exterior Door frames: Exterior door frames shall be 16 gauge.

C. Interior Door frames: Interior door frames shall be 16 gauge sheet steel.

D. Masonry Grout Mortar: Conforming to requirements of the "Reinforced Unit Masonry" Section 04200.

E. Frame Anchors: SDI standard, compatible with adjacent construction, and welded to door frame.

F. Stiffeners: Shall be not less than 12-gauge steel.

G. Door Lite: Exterior doors shall be provided with a glass lite of size shown on the drawings. Fixed moldings shall be securely welded to door on security side. Loose stops for nonsecurity side shall be secured to frames opening with countersunk screws. Provide 1/4 inch safety glass for doors as shown on drawings.

2.4 FABRICATION

A. General: Doors and frames shall be reinforced, drilled, and tapped in shop to receive projecting hardware. Perform drilling and tapping for surface hardware in the field. Use templates furnished by hardware manufacturer to ensure correct fitting and installation of hardware.

B. Doors: Top and bottom of doors shall receive a flush end closure treatment. Surface sheets shall be supported by continuous hat-shaped member not less than 20 gauge, spaced not more than 6 inches on center, and internally spot welded to both surface sheets not more than 4 inches on center. Undercut each door leaf as required for proper clearance and installation of weatherstripping and threshold.

C. Frames: Frames for installation in exterior walls shall be of welded type, with the number of anchors on each jamb as specified on the drawings.

D. Frames for installation in exterior walls shall be welded type, and for installation in interior walls shall be welded or knock-down type.

E. Mortar guards of minimum 26-gauge sheet steel shall be provided at hardware mortises on door frame to be set in concrete masonry walls.

F. Provide strike at jambs for interior single doors with not less than two rubber silencers and at head of interior double doors with two rubber silencers, one for each leaf.

G. Shop Finish: Exterior doors and frames shall be galvanized, followed by a phosphate treatment and given the manufacturer's standard shop coat of nonbituminous priming paint. Interior doors and frames shall be treated to ensure maximum paint adhesion and given manufacturer's standard shop coat of nonbituminous priming paint.

PART 3 EXECUTION

3.1 INSTALLATION: Install doors and frames in true alignment with head level and jambs plumb. Where frames are required to be filled with grout mortar, inside surfaces of frames shall be given a heavy coat of bituminous water-resistant paint prior to installation.

A. Install welded-type door frames at the time walls are constructed, braces, and anchor in place. Install knock-down-type frames for stud walls and anchor in place in accordance with manufacturer's instructions.

B. Jambs and heads of door frames in concrete masonry walls shall be filled with masonry mortar or grouting mortar. Joints between frames and wall shall be tooled smooth, raked, and the joints sealed.

3.2 Glazing shall be factory installed.

3.3 Hardware: In accordance with the "Door Hardware" section.

3.4 FIELD PAINTING: After doors are installed, but before projecting hardware is installed, doors and door frames shall be painted in accordance with Section 09900, Painting.

3.5 ADJUSTMENT: Before acceptance of work, test operation of doors and correct defects in operation.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for

furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Power-operated and manually operated coiling overhead doors with weatherstripping and steel door frames. The two doors for the Injection Building shall be manually operated; the door for the Office/Shop shall be power-operated.

1.2 SUBMITTALS: For review.

A. Product Data: Include manufacturer's catalog sheets for doors and electric operator.

PART 2 MATERIALS

2.1 Overhead Coiling Door Assembly: Overhead door assembly shall have the following features:

A. Door Sections: Interior and exterior skin, 24 gauge galvanized steel (22 gauge at Office/Shop Building), factory prefinished, insulated slats with 7/8 inch urethane foam insulation. Size shall be as shown on the drawings.

B. Guides: Minimum 16 gauge galvanized steel fastened with expansion anchors to CMU. Door shall have clearance during opening and closing operation. When closed, door sections shall be tight against jamb.

C. Counterbalance: Doors shall be counterbalanced by heat-treated steel torsion springs mounted on a crossheader shaft. Springs shall be adjustable for proper tension.

D. Hood: Minimum 24 gauge steel, galvanized, prime painted.

E. Operation: Two doors shall have manual operation by inside lift handle and locking bar; one door shall be power operated and provided with a sensing edge bottom.

F. Weatherstripping: Doors shall be provided with full head, jamb, and sill perimeter seals by door manufacturer.

G. Manufacturers Equal To:
   1. Series 625, heavy duty door by Overhead Door Corp., P.O. Box 809046, Dallas, TX 75240-9046; or
   2. Series IF, commercial duty door by Raynor Garage Doors, P.O. Box 448, Dixon, IL 61021;

2.2 ELECTRIC OPERATOR: Door operator shall be jack shaft type, side mounted, trolley belt or gear drive type, adjustable clutch, automatic brake, instant reversing, ½ H.P., NEMA 1 enclosure, with overload protection. Doors shall be manually operable in case of power failure.

2.3 CONTROLS: Three-button control with open-close-stop momentary contact.

PART 3 EXECUTION

3.1 INSTALLATION

A. Contractor shall verify that there is sufficient space to the underside of the roof structure for installation of the doors supplied. Overhead doors, including accessories, shall be installed in accordance with manufacturer's instructions. Installations shall be such that door openings are closed to wind and weather when doors are closed. Door opening shall be clear when doors are open. The Contractor shall drill holes in concrete, steel and masonry as required for door installation.

B. Before acceptance of work, the Contractor shall test operation of doors and correct any defects in operation.

3.2 FINISHING AND PAINTING: Overhead doors shall be factory-primed and finished. Hood, miscellaneous steel components and accessories shall be field painted.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost

of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fixed glass aluminum windows including hardware, anchors, and miscellaneous material for a complete installation.

B. Precast terrazzo window sills.

1.2 SUBMITTALS: For review.

A. Product Data: Include details of material, frame, thermal performance ratings, and finish.

B. Color Samples: Terrazzo samples for color selection.

1.3 PRODUCT HANDLING AND PROTECTION: Prevent damage and deterioration. Protect windows from paint overspray and scratching of frame finish. Clean units after completion of building work.

PART 2 MATERIALS

2.1 MANUFACTURER: Equal to Kawneer Company series 8425T, thermal, commercial units.

A. Sizes: As shown on the drawings.

B. Frames: Extruded aluminum alloy, with thermal break. Finish to be factory applied and as selected by Owner.

C. Accessories: Weatherseal shall be compatible with adjacent material, continuous, and replaceable. Screws, fasteners, and hardware shall be noncorrosive and compatible with aluminum.

D. Glazing: 1-inch sealed insulating glass conforming to ASTM C1036 standard specification for flat glass. No tinting is required.

2.2 WINDOW SILLS: Precast interior window sill manufactured in accordance with the "National Terrazzo and Mosaic Association". Size sill to fit site conditions and include suitable anchorage or adhesive. Profile of sill shall be as detailed on the drawings.

PART 3 EXECUTION

3.1 Install in accordance with manufacturer's published instructions. Set plumb and level, without bowing, forcing, or twisting. Seal all around window frames on the inside and outside of the building.

3.2 Caulk all around window sills.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for steel interior and exterior doors, complete with fasteners, anchors, and other accessories for full operation of hardware.

1.2 SUBMITTALS: For review.

A. Product Data: Manufacturer's catalog cuts for door hardware. Mark catalog cuts to identify data for each item.

B. Hardware Schedule: Include door numbers and hardware group numbers; handing data; hardware manufacturer's name and hardware catalog item numbers, including trim, finish, and size; and other information for complete hardware schedule.

C. Maintenance Material: With delivery of permanent keys, deliver to the Contracting Officer one complete set of adjustment tools for locksets, latchsets, and closers.

PART 2 MATERIALS

2.1 DOOR HARDWARE: Provide each door in each hardware group of Table 2 - Hardware Schedule with type and number of hardware items specified by Table 1 - Door Hardware Types.

A. Items for each hardware type shall be products of same manufacturer. Hardware shall be equal to Manufacturer's catalog items referenced in Table 1.

2.2 KEYING:

A. Door locks shall be keyed the same.

B. Existing Master Keying: Key all locks to this system. Key numbers for existing keying system will be furnished to the Contractor by the Contracting Officer.

C. Construction Keying: Supply locks initially with construction keys or temporary construction cores. Where locks are supplied with construction keys, permanently void construction keys after completing construction. Where locks are supplied with temporary

construction cores, provide interchangeable permanent cores which are removable only by special control key.

D. Permanent Keys: Provide each lock with two permanent change keys and three master keys. Stamp keys legibly with words "U.S. Property - Do not duplicate." Mark keys with key numbers. Mark locks in concealed position with appropriate key number. Ship permanent keys and lock cores directly from lock supplier by registered mail to the Contracting Officer; or deliver personally from the lock supplier to the Contracting Officer.

2.3 FASTENERS: Provide hardware with screws, bolts, and other fasteners of suitable size and type to anchor hardware in position for long life under hard use. Provide expansion shields, toggle bolts, hex bolts, and other anchors suitable for type of material to which hardware is applied. Fasteners shall be compatible with or match hardware material and finish.

2.4 MANUFACTURER'S DIRECTORY: Reference numbers used in Table 1 - Door Hardware Types are catalog numbers of the following manufacturers:

Best Lock Corp.
P.O. Box 50444
Indianapolis, IN 46250

Builders Brass Works Corp.
Thomas Industries, Inc.
P.O. Box 2043
Los Angeles, CA 90023

Hager Hinge Company
139 Victor Street
St. Louis, MO 63104

Norton Door Control
P.O. Box 25288
Charlotte, NC 28229-80110

Pemko Manufacturing Company
P.O. Box 3780
Ventura, CA 93006

Reese Enterprises, Inc.
P.O. Box 1A
Rosemount, MN 55068

Schlage Lock Company
2401 Bayshore Boulevard
San Francisco, CA 94119-3324

Stanley Hardware Division
Stanley Works
195 Lake Street
New Britain, CT 06050

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Install hardware in accordance with manufacturer's recommendations, using proper templates.

B. Painting: Do not install projecting hardware until painting of doors and frames is complete.

C. Thresholds: Fit tight to doorframes, set in full beds of grouting mortar or mastic, and attach to concrete with machine screws in expansion anchors.

D. Adjustment: Test operation of each door, verify lock location, adjust hardware, and correct defects in operation.

TABLE 1 - DOOR HARDWARE TYPES

Type	Hardware Schedule Designation	Description	Finish	Manufacturer's Catalog Items	Number Required Per Door
Hinges	H1	4 ½ inch x 4 ½ inch, steel regular weight, full mortise, template, five knuckles, two ball bearings, nonrising removable pin, and flat button tips.	US10	Hager BB1279. Stanley FBB179.	1 ½ pair for each 7 feet high.

pe	Hardware Schedule Designation	Description	Finish	Manufacturer's Catalog Items	Number Required Per Door
ock set	L1	Mortise lock set with lever, roses, and cylinder rings; antifriction latch bolt, stops or toggle in face, deadbolt throw of 1 inch; screwless knob spindle; and cylinders with inter-changeable six-pin tumbler core. Latch bolt by lever from either side except when knob outside is locked by stop or toggle in face, and by key outside when outer lever is locked. Deadbolt by key outside and turn knob inside. Rotating inside knob simultaneously retracts both latch bolt and deadbolt.	612	Best 34H6F4ACA. Falcon M2630HG. Schlage L9453R 65/424.	
	L2	Cylindrical lock set with levers and roses; antifriction latch bolt; privacy lock.	612	Best 73K7L15C. Schlage D53PD	
	L3	Cylindrical lock set with lever, roses; anti-friction latch bolt; classroom lock.		Best 73K7R15C Schlage D70PD	
	L4	Cylindrical lock set with lever, roses; anti-friction latch bolt; passage set.		Best 73K0N15C. Schlage D10S	

e	Hardware Schedule Designation	Description	Finish	Manufacturer's Catalog Items	Number Required Per Door
oor lo r	C1	Modern-type surface closer top jamb installation with closing force range adjustable 15 percent or more over minimum spring load; adjustable back check and adjustable closing speed and latching speed; and hold-open arm.	Standard lacquer finish	Norton 8500 series.	
o stop	ST1	Floor-mounted dome with rubber bumper; fastener as required for concrete floor.	612	Builders Brass/ Trimco	1 for each leaf.
o ottom w p	DBS	One Piece, aluminum rain drip with vinyl sweep fastened to bottom of door.	Bronze	Pemko 345DV.	1 continuous piece at each door.
hreshold	T1	One-piece extruded aluminum threshold 1/4-inch to ½-inch height; 6-inch width; length equal to full width of door; notched ends at doorstops; countersunk screw holes spaced approximately 12 inches center to center, with end holes not more than 3 inches from ends of thresholds; and flathead machine screws that color match the thresholds.	Mill	Reese 425A Pemko 172A	1 continuous at sill.
Ve her- ri ing	W1	Self-adhesive silicone rubber weatherstripping.		Reese 797. Pemko S88D.	Continuous at head and jambs.

TABLE 2 - HARDWARE SCHEDULE

Hardware Group Number	Door Numbers	Required Hardware (See Table 2B)	Remarks
1	1, 2, 7, 8	H1 L1 C1 T1 W1 DBS	Outswinging exterior doors.
2	9	H1 L1 T1 W1 DBS ST1	In - swinging exterior door.
3	3	H1 L4 C1	3/4 HR fire rated door, no hold-open on closer.
4	4, 5	L2 ST1	Toilet and shower.
5	6	H1 L3 ST1	Storage room.
6	10	H1 L4 ST1	Injection building, interior door.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal stud framing.

B. Gypsum board.

C. Tile backer board.

D. Accessories as required for complete installation.

1.2 MATERIAL STORAGE: Store gypsum board inside under cover, flat, and off the floor. Deliver material to site with manufacturer's labels intact.

1.3 ENVIRONMENTAL REQUIREMENTS: Maintain temperature at 55 to 70°F during installation. Protect adjacent surfaces from damage and stains.

PART 2 MATERIAL

2.1 METAL STUD FRAMING: Metal studs, runner channels, and accessory members made from not less than 20-gauge galvanized steel, other noncorrosive metal, or steel protected with corrosion-resistant paint; 3 5/8 inches wide; and equal to Incor, Inc., 7061-2963 Rexford Road, Charlotte, NC 28211; USG Steel Framing Systems, United States Gypsum Company, 101 South Wacker Drive, Chicago, IL 60606.

2.2 GYPSUM BOARD

A. Nonrated Board: Federal Specification SS-L-30D, Type III (wallboard), Grade R (regular core), Class 1 (plain face), Form A (plain back), Style 3 (tapered edge), ½-inch thickness.

B. Water-Resistant Board: Federal Specification SS-L-30D, Type VII (water-resistant gypsum backing board), Grade W (water-resistant treated core), Class 2 (water-resistant surface), Form A (plain back), Style 3 (tapered edge), ½-inch thickness.

2.3 TILE BACKER BOARD: Aggregated Portland cement board with polymer-coated, woven glass-fiber mesh in back and front surfaces. Equal to Durock Interior Tile Backer Board by United States Gypsum Company.

2.4 ACCESSORIES

A. Concrete Anchor Devices: Power-driven or powder-actuated expansion bolts as specified in the "Miscellaneous Metals" paragraph.

B. Framing Fasteners: Screws of type recommended by manufacturer.

C. Gypsum Wallboard Fasteners: Drywall screw fasteners shall be Phillip-head screw fasteners with a self-drilling point and self-tapping bugle head, for use with a power-driven tool. Size of fasteners shall be as recommended by manufacturer.

D. Metal Corners and Trim: Galvanized steel or other noncorrosive metal and of standard commercial quality.

E. Control Joints: Equal to United States Gypsum Control Joint No. 093.

F. Tape and Joint Cement: Material for treatment of joints in gypsum wallboard, including tape and compound, shall conform to requirements of ASTM C 475.

G. Calking: As specified in Section 07900 Joint Sealer.

PART 3 EXECUTION

3.1 INSTALLATION

A. Metal Stud Framing: Install in accordance with ASTM C 754.
1. Unless otherwise shown on the drawings, studs shall be spaced 16 inches on center maximum. Space fasteners as recommended by manufacturer.
2. At the Contractor's option, metal stud framing may be welded, if recommended by manufacturer, in lieu of fastener connections. Welding shall be in accordance with applicable standards of AWS A5.
3. Install supplementary studs and reinforcement to support wall-mounted fixtures and equipment.

B. Gypsum Board: Do not apply gypsum board to walls and ceiling until pipes, electrical conduit, insulation, and other features to be concealed are placed.
   1. Where practicable, apply gypsum board with long dimension perpendicular to studs. Butt board together tightly at joints and stagger end joints. Ends of board shall bear on a support with at least 5/8-inch bearing.
   2. Install metal corners at outside corners and other locations where required to conceal exposed edges. Install metal trim at openings and other locations as required to conceal exposed edges of board. Install metal corners and trim in accordance with manufacturer's instructions.
   3. Install with screw fasteners of the type recommended by manufacturer, and screwheads shall be driven to provide a slight depression below the board surface. Do not drive screw fasteners closer than 3/8 inch from board edges.

C. Wall Attachment to Metal Studs: Fasten gypsum board to each support with screws spaced not more than 12 inches on center in the field of board and at 12 inches on center staggered along abutting ends.

D. Joints: Following attachment of gypsum board, tape joints in board. Install tape reinforcement at all inside corners.
   1. Fill exposed joints evenly and fully with joint compound using tools designed for the purpose. Compound shall extend approximately 1 ½ inches on each side of joint. Tape shall then be applied directly over compound. Press tape into place with a putty knife and smooth compound. After compound has dried thoroughly, apply another thin coat of compound over tape and feather out 4 inches on each side of joint. When second coat of compound has dried, apply a third coat of compound over second coat and feather out not less than 6 inches on each side of joint.
   2. Between applications of compound at joints, rough spots or areas shall be sanded smooth. Machine application of tape will be permitted. Twenty-four hours after third coat has been applied, entire area covered with compound shall be sanded smooth and level with wallboard.
   3. Dimples at screwheads and other depressions in board surface shall receive three coats of joint compound, applied as each coat is applied to joints.

E. Control Joints: Isolate gypsum board surfaces with a control joint where gypsum board run exceeds 30 feet.

F. Insulation: As specified in Section 07213 Batt Insulation.

G. Painting: Paint exposed surfaces of gypsum board and metal trim in accordance with Section 09900 Painting.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES: Ceramic tile floor, walls, wainscot, and base installed using the thin set method with grouted joints.

1.2 QUALITY ASSURANCE: Conform to the following ANSI standards as applicable.

A. ANSI A108.4: "Ceramic Tile Installed With Water-Resistant Organic Adhesives or Water Cleanable Tile Setting Adhesive".

B. ANSI A118.4: "Latex-Portland Cement Mortar".

C. ANSI A136.1: "Organic Adhesives for Installation of Ceramic Tile".

D. ANSI A137.1: "Recommended Standard Specifications for Ceramic Tile".

1.3 SUBMITTALS: For review.

A. Samples: Submit samples of each type of tile and grout for color selection.

PART 2 MATERIALS

2.1 CERAMIC WALL TILE

A. Equal to American Olean Wall Tile and with the following features:
1. Size: 4 1/4 x 4 1/4
2. Edge: Square
3. Finish: Matte glazed
4. Color: As selected.
5. Specification: In accordance with TCA 137.1.

2.2 CERAMIC FLOOR TILE

A. Equal to American Olean unglazed mosaics and with the following features:
1. Size: 1 x 1.
2. Edge: Square.

3. Finish: Matte glazed.
4. Color: "A" group as selected.
5. Specification: In accordance with TCA 137.1.

2.3 TRIM SHAPES: As required for complete installation; of same size, material, color, and finish as field tile.

2.4 METAL EDGE STRIPS: Zinc alloy or stainless steel; 1/8 inch wide at top edge, with integral provisions for anchorage to mortar bed or subslab.

2.5 MORTAR MATERIAL, GENERAL: As recommended by tile manufacturer for required application and in accordance with ANSI A108.

2.6 ORGANIC ADHESIVE: ANSI A136.1-85, Type II.

2.7 LATEX-PORTLAND CEMENT GROUT: Portland cement with latex additives for a more flexible and less permeable grout; equal to Flexible Grout Additive by L and M Manufacturing, Inc.

PART 3 EXECUTION

3.1 PREPARATION

A. Gypsum Wallboard: Surfaces shall be tape-finished and smooth at fastener depressions and joints. Surfaces shall be sanded, dusted, and primed with one coat of primer/sealer. Seal surface of taped joints in water-resistant gypsum board to prevent water damage. Maximum variation in surfaces shall not exceed 1/8 inch in 8 feet from required plane.

B. Concrete Floor: Slab to be well cured, dimensionally stable, and free from cracks, waxy or oily films, and curing compounds. Mortar bond coat or adhesive shall be a minimum of 3/32 inch thick to a maximum of 1/8 inch thick.

C. Penetrations: Complete all other work that penetrates the substrate before beginning tile work.

3.2 INSTALLATION: Install ceramic tile and base in accordance with ANSI standards and these specifications. Maintain minimum temperature limits and install mortar and grouting material in accordance with manufacturer's installation data.

A. Sealing: Neutralize and seal substrates in accordance with mortar and adhesive installation data.

B. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Verify pattern is uninterrupted through openings. Provide uniform joint widths, subject to variance in tolerance allowed in tile size.

C. Placement: Accurately form intersections and returns. Form corners and bases neatly. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight, aligned joints. Fit tile closely to electrical outlets, piping, floor drains, and fixtures so that plates, collars, or covers overlap tile. Extend tile into recesses and under equipment and fixtures to form a complete covering without interruptions. Terminate work neatly at obstructions, edges, and corners without disruption of pattern or joint alignments. Form internal corners square and external corners bullnosed.

D. Sound tile after setting and replace hollow sounding units. Allow tile to set for a minimum of 48 hours prior to grouting.

E. Metal Edge Strips or Thresholds: Provide where exposed edge of ceramic tile flooring is to meet concrete, vinyl-composition floor tile, or other floor finish.

F. Cleaning: Upon completion of placement and grouting, clean all tile surfaces so they are free of foreign matter. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's published installation data, but not sooner than 14 days after installation. Protect metal surfaces and fixtures from acid cleaning. Flush the surface with clean water before and after cleaning.

G. Repairing: Repair or replace all cracked, chipped, broken, unbonded, or otherwise defective tile work.

H. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect tile work with Kraft paper or other covering during the construction period to prevent damage and wear. Prohibit foot and wheel traffic from using tiled floors for at least 4 days. Before final inspection, remove protective covering and rinse neutral cleaner from all tile surfaces.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES: Exposed suspension grid, acoustical units, wall angles, spacers, and other accessories required for installation.

1.2 QUALITY ASSURANCE

A. Tolerances: Suspension system components, hangers, and fasteners, supporting light fixtures, grills, and acoustical units shall not deflect more than 1/360 of span per ASTM C 635. Allowable tolerance of finished system shall be level within 1/4 inch in 10 feet.

1.3 SUBMITTALS FOR REVIEW

A. Samples: Submit two samples of acoustical panels to illustrate color and range of appearance.

1.4 INSTALLATION CONDITIONS

A Space Enclosure: Do not install acoustical ceiling until space has been enclosed and is weathertight; until wet-work in the space has been completed and is nominally dry; until work above ceilings has been completed; and until ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

1. Coordination: Coordinate work of this section with that of others, including electrical and mechanical installers providing material to be integrated with this system.

PART 2 MATERIALS

2.1 SUSPENSION SYSTEM:

A. Metal suspension systems for suspended, acoustical, lay-in unit ceilings shall be exposed-grid-type metal suspension system for 24-inch x 48-inch acoustical lay-in units with main runners spaced at not more than 48 inches on center; intermediate duty in accordance with ASTM C 635, and equal to Snap Grid 200 System, by Chicago Metallic Corporation, 4849 South Austin Avenue, Chicago, IL 60638; or Donn DX Exposed Grid System by USG Interiors, 125 South Franklin St., Chicago, IL 60680.

A.. Suspension systems shall be complete with all accessories required for installation and shall have the following features:
1. Main and Cross Members: Double web design with rectangular bulb.
2. Wall Angle, Edge Molding, or Trim: Exposed face of 1 inch.
3. Finish: Manufacturer's standard white baked enamel finish..

2.2 HANGERS AND TIE WIRE

A. Hanger wires shall be galvanized, soft annealed, mild steel, prestretched wire which is not less than 12 gauge. Wire for ties shall be not less than 18 gauge and galvanized, annealed steel wire. Rod and strap hangers, if used, shall be of a size recommended by ceiling suspension system manufacturer.

2.3 ACOUSTICAL UNITS: Units shall be Class A (flame spread 25 of less), mineral fiber acoustical units, 24 inches x 48 inches in nominal size; 5/8-inch minimum thickness; fissured pattern; white finish; noise reduction coefficient (NRC) of minimum. Texture and finish of units shall be equal to Acoustone "F" Fissured by USG Interiors.

2.4 LIGHT FIXTURE SUPPORT: Concealed support system integrated with ceiling suspension system and compatible with light fixtures specified in the Electrical Section.

PART 3 EXECUTION

3.1 INSTALLATION

A. Layout: Layout spaces in accordance with the drawings. Construct acoustical ceilings so that exposed members of the suspension system are at right angles or parallel to walls of the room and so that edges of exposed members of the suspension system are in alignment and all faces are in a level plane. Install in accordance with manufacturer's recommendations and ASTM C 636.

B. Wire Hangers: Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other support devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures. Wires shall not splay more than 5 inches in a 4-foot vertical drop. Provide one 12-gauge wire hanger to support suspension system at each corner of each lay-in light fixture in addition to other support wires.

C. Connections: Cope exposed flanges of intersecting suspension system members so that flange faces will be flush. Cope flange of member supported by other member.

D. Accessibility: Ceilings shall have accessibility at any location.

E. Wall Angles: Install wall angles as needed to conceal edges of acoustical units which would otherwise be exposed to view after completion of the work. Anchor with fasteners or, if not possible, secure in place with permanent adhesive.

3.2 CLEANING AND PROTECTION

A. Clean exposed surfaces of acoustical ceilings including units, trim, wall angles, and suspension members; comply with manufacturer's instructions for cleaning and touchup of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

B. Protect acoustical ceilings, including temperature and humidity limitations and dust control, in accordance with manufacturer's recommendations.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES: Vinyl-composition floor tile and rubber base.

1.2 SUBMITTALS FOR REVIEW

A.. Samples: Submit two color charts showing range of colors available for specified style of floor tile and of base for color selection.

1.3 PRODUCT DELIVERY AND STORAGE: Deliver in manufacturer's original, unopened cartons with labels indicating brand names, colors, patterns, and quality designations legible and intact. Store in accordance with manufacturer's directions and recommendations.

1.4 ENVIRONMENTAL REQUIREMENTS: Maintain temperature in areas to receive floor tile between 70 and 90°F for not less than 24 hours before and 48 hours after installation. Thereafter, maintain temperature at a minimum of 55°F.

PART 2 MATERIALS

2.1 VINYL-COMPOSITION TILE: Federal Specification SS-T-312B, Type IV (vinyl-composition), Class 2 (through-pattern tile) 1/8 inch thick, 12 inches by 12 inches, and style or pattern equal to Standard Excelon by Armstrong World Industries, Inc., Floor Division, P.O. Box 3001, Lancaster, PA 17604; Collage by Tarkett, Inc., P.O. Box 264, Parsippany, NJ 07054; or Architectural Series by Kentile Floors, Inc., 58 2nd Avenue, Brooklyn, NY 11215.

2.2 RUBBER COVE BASE: Cove base shall be color as selected, 4 inches high, and equal to Cove Base by Burke Industries, 2250 South 10th Street, San Jose, CA 95112-4197; Flexco Rubber Cove Base, Flexco Company, P.O. Box 553, Tuscumbia, AL 35674-9989; or Ez-Wrap Rubber Cove Base by Duramax Inc./Johnson Rubber Company, Flooring Products Division, 16025 Johnson Street, Middlefield, OH 44062.

A. Internal and external molded corners shall be furnished and installed for internal and external corners, respectively, where rubber base is required.

2.3 ADHESIVE: Water-resistant type recommended by tile manufacturer.

2.4 LIQUID WAX OR PROTECTIVE COATING: Type recommended by tile manufacturer.

2.5 VINYL EDGING STRIPS: Vinyl beveled edging strips, 1 inch wide, flush with stops, and beneath door.

PART 3 EXECUTION

3.1 PREPARATION: Clean surfaces of grease, dirt, paint, and other foreign material. Repair depressions and unevenness in concrete floors with floor fill. Apply floor fill in accordance with manufacturer's instructions. When recommended by tile manufacturer, apply primer coat to surfaces to be covered with floor tile and rubber base.

3.2 INSTALLATION: Install in accordance with manufacturer's instructions. Install joints close and even with finished surfaces smooth and in a true plane. Install with joints parallel or at right angles to room walls in a checkerboard pattern. Border tile on opposite sides of room shall be of equal width and, where practicable, one-half tile or greater in size. Adhere smoothly in place without holidays, blisters, patches, notches, gaps, offsets, irregularities in alignment, or conspicuous joints. Fit into recesses and scribed for tight fit against stationary fixtures. Minimize number of base joints. Scribe and fit base to doorframes and other intersecting surfaces.

3.3 CLEANING AND WAXING: Clean floor tile, rubber base, and edging strips of surplus cement and other foreign material. Apply two coats of wax to vinyl flooring.

A. Avoid excessive use of water or other cleaning agent which might work into joints. Apply wax or protective finish in accordance with manufacturer's instructions and a minimum of 7 days after installation.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES: Material and equipment to apply primer, paint, and coating in accordance with this Section.

A. Methods of preparing and apply paint or coating not included herein shall be in accordance with manufacturer's instructions.

1.2 SUBMITTALS FOR REVIEW

A. Samples: Submit manufacturer's paint decks for color selection.

1.3 DELIVERY, STORAGE: Deliver paint material in sealed, labeled containers, with manufacturer's name, type of paint, brand name, color designation, date of manufacturing, and instructions for mixing and reducing. Store paint material as recommended by the manufacturer.

1.4 ENVIRONMENTAL CONDITIONS: Provide ventilation, lighting, and necessary safety equipment for protecting workmen during painting operation.

1.5 PROTECTION: Protect other surfaces from paint and damage. Repair damage as a result of inadequate or unsuitable protection. Furnish drop cloths, shields, or protective equipment to prevent spraying or droppings from fouling surfaces not being painted, including surfaces within storage and preparation area.

1.6 MANUFACTURERS: Manufacturers listed below are regarded as establishing a standard of quality:

A. PPG Industries, Inc., One PPG Place, Pittsburgh, PA 15272.

B. Sherwin-Williams Company, 101 Prospect Avenue, Cleveland, OH 44115.

C. Tnemec Company, Inc., P.O. Box 1749, Kansas City, MO 64141-1749.

D. Thoro System Products, 7800 NW. 38th Street, Miami, FL 33166.

PART 2 SURFACE PREPARATION FOR PAINTING

2.1 GENERAL: Surface preparation shall be in accordance with the manufacturer's installation instructions and as given below.

A. Equipment and Metalwork: After solvent cleaning, prepare surfaces as follows:
   1. Surfaces with weathered, gloss, or semigloss paint shall be lightly sanded.
   2. Surfaces with loose paint and other foreign matter shall be cleaned by hand tool methods conforming to SSPC-SP2, if required, followed by commercial grade sandblasting conforming to SSPC-SP6.
   3. Surfaces with loose paint and rust shall be cleaned by commercial grade sandblasting conforming to SSPC-SP6.
   4. All surfaces shall be recleaned with solvent.

2.2 CONCRETE AND CONCRETE MASONRY: Remove excess mortar and smears. Replace defective mortar to match adjacent work. Age new concrete and concrete masonry at least 3 weeks before apply coating system.

2.3 GYPSUM BOARD: Repair damaged surfaces. Prior to sealing and painting, clean surfaces of dust and other foreign material.

PART 3 PAINT SYSTEMS

3.1 GENERAL: Selected paint system for any particular item shall consist of primer and finish coat from the same manufacturer.

3.2 GALVANIZED SURFACES: Repair of galvanized surfaces not required to have a finish coat shall be a minimum 3.0 mils dry film thickness and equal to one of the following:

A. PPG Industries, Inc., Metalhide 1001 Inorganic Zinc Rich Primer.

B. Sherwin-Williams Company, Zinc Clad I B69A56.

3.3 METALWORK: Exterior and interior metalwork including hollow metal doors, frames and miscellaneous metalwork, shall be painted equal to the following:

A. Sherwin-Williams Company (Ferrous Metal Surfaces):
   1. Primer Coat: Kem Kromik Universal Metal Primer, colors white or brown, 3.0 mils dry film thickness.
   2. First and Second Finish Coats: Industrial Enamel HS.

3.4 STRUCTURAL STEEL AND ACCESSORIES: Structural steel framing, joists, roof deck, and accessories shall be painted equal to the following:

A. Sherwin-Williams Company (Ferrous Metal Surfaces):
   1. Primer: 2 coats of Opti-Bond Multi-Surface Coating.
   2. Finish Coats: None required.

3.5 EXTERIOR CONCRETE, MASONRY

A. Sherwin-Williams Company:
   1. Primer: Loxon Exterior Acrylic Masonry Primer.
   2. First and Second Finish Coats: Loxon Exterior Acrylic Masonry Flat Coating.

3.6 INTERIOR MASONRY

A. Sherwin-Williams Company:
   1. Heavy Dutch Block Filler.
   2. First and Second Finish Coats: Silicone Alkyd Enamel Low VOC.

3.7 GYPSUM WALLBOARD:

A. Sherwin-Williams Company:
   1. Primer Coat: Pro-Mar 200 Interior Latex Wall Primer.
   2. First and Second Finish Coats: Promar 200 Interior Latex Semi-gloss Enamel.

PART 4 COST

4.1 COST

A. The cost of complying with this section including all labor, equipment and materials will not be paid for separately, but will be considered incidental to other terms for which payment is made. The Contractor shall include in his price bid an amount sufficient to compensate him for compliance with the requirements of this section.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Single tier quiet lockers.

B. Locker bench.

C. Installation hardware.

1.2 SUBMITTALS FOR REVIEW

A. Product Data: Submit manufacturer's produce information describing materials, components and finishes.

B. Samples: Submit color charts showing color range of factory-applied finish for selection.

PART 2 MATERIALS

2.1 FREE STANDING STANDARD

A. Sheet Metal: Mild cold-rolled sheet steel, free from surfaces imperfection, with rust-resisting primer and baked-on enamel.

B. Size: Single tier, 15- by 15- by 60-inches high.

C. Body: 24 gauge sides, back, top, and bottom with edges formed to provide added strength.

D. Door Frame: 16-gauge formed channel shape, welded to body with welds ground smooth.

E. Door: 16-gauge channel reinforcement at top and bottom. Finish edges smooth.

F. Hinges: 2-inch high, five-knuckle, non-raising pin, three per door.

G. Legs: 6-inch high.

H. Ventilation: Louvers at top and bottom of door.

I. Hat Shelf: Flanged all around, 24 gauge.

J. Coat Hook: One double prong hook.

K. Attachments and Fasteners: Manufacturer's standard design.

2.2 MANUFACTURERS

A. Lyon Steel Lockers by Lyon Metal Products, Inc. P.O. Box 671, Aurora, IL 60507.

B. Delta Lockers by Interior Medart, P.O. Box 658, Medart Drive, Greenwood, MS 38935-0658.

C. Standard by Republic Storage Systems, 1038 Belden Avenue, N.E., Canton, OH 44705.

PART 3 EXECUTION

3.1 INSTALLATION

A. Anchoring: Anchor lockers to walls with suitable anchor devices. Bolt lockers together to provide rigid installation. Install legs in accordance with manufacturer's instructions.

B. Cleaning: Field touch-up of scratches or defaced enamel finishes will not be accepted. Damaged, scratched, or marred defective materials will be rejected, and shall be replaced. Clean surfaces free of oil and imperfections.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Recessed paper towel dispenser/waste receptacle.

B. Toilet tissue dispenser.

C. Grab bars.

D. Shower curtain and rod.

E. Soap dispensers.

F. Mirrors.

G. Stainless steel shelf.

1.2 SUBMITTALS FOR REVIEW

A. Product Data: Submit manufacturer's technical data for each toilet accessory.

B. Maintenance Material: Deliver keys to the Owner's Representative at the site.

PART 2 MATERIALS

2.1 PRODUCTS

A. Recessed Paper Towel Dispenser Waste Receptacle: Size to dispense not less than 500 C-fold towels; removable molded plastic waste container locked to cabinet; receptacle of 4 gallon capacity; for 4-inch-deep wall space; satin stainless-steel finish; 22 gauge. Equal to Bradley, Bradex model 235.

B. Recessed Single-Roll Toilet Tissue Dispenser: To accommodate core tissue up to 5-inch diameter; recessed housing and projecting parts of satin finish stainless steel; free-turning roller that telescopes for filling. Equal to Bradley, Bradex model 5084.

C. Grab Bars: 1 1/4-inch outside diameter with wall thickness 18 gauge; nonslip gripping surface; stainless steel; concealed mounting. Equal to Bradley, Bradex model 059 with 899-011 concealed mounting kit.

D. Shower Curtain and Rod: White vinyl shower curtain, 6 gauge, hemmed edges, heat sealed grommets on 6-inch centers, equal to Bradley, Bradex model 9533, 48-inch width. Shower rod with concealed mounting, satin finish stainless steel, equal to Bradley, Bradex model 9539. Shower curtain hooks equal to Bradley, Bradex model 9536.

E. Surface-Mounted Liquid Soap Dispenser: Globe type soap dispenser with chrome plated valve housing, stainless steel valve and polyethylene globe with 16 oz. capacity. Globe unscrews for filling. Equal to Bradley, Bradex 659.

F. Mirrors: Glass mirror; stainless-steel frame; satin finish; concealed hangers and theft-resistant mounting; sizes 24x30. Equal to Bradley, Bradex model 780.

G. Stainless Steel Shelf: Satin finish, welded steel bracket, 3/8" front flange and rounded corners. Equal to Bradley, Bradex model 7512-30.

PART 3 EXECUTION

3.1 INSTALLATION: Install fixtures and accessories in accordance with manufacturer's printed instructions. Install true, plumb, level, and securely anchored to substrate. Mount recessed accessories into wall openings with sheet metal screws into metal frames. Mount surface-mounted accessories to concealed anchors. Adjust accessories for proper operation. After completion of installation, clean and polish exposed surfaces.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. Untreated water will be supplied by trucking well water from Logan to the injection well site. The work in this section consists of providing an operating system based on designing, building, testing and disinfecting a potable water supply system for domestic water supply only. No fire protection or irrigation use of potable water is anticipated.

1.2 RESPONSIBILITY FOR DESIGN

A. The design of the system will be based on design criteria for the system described herein, the layout shown on the drawings, and all applicable AWWA Standards and EPA drinking water standards. All drawings shall be sealed by a registered professional engineer in the State of New Mexico.

1.3 RELATED SECTIONS

A. Section 02225: Structural Excavation and Backfill.

B. Section 03301: Structural Concrete.

C. Section 02221: Utility Trenching and Backfilling.

D. Instrumentation and Control.

1.4 SYSTEM REQUIREMENTS

A. All components of the potable water supply system shall be provided by manufacturers that are regularly engaged in providing the equipment. All components and the system in its entirety shall meet EPA, AWWA and State of New Mexico regulations and standards.

B. The location of the potable water system and its relationship with ground and floor elevations and other improvements are shown on the drawings. The design of the system shall include coordination of conflicts with other utilities and design of the system for earth and traffic loads, if applicable.

C. The design criteria must meet the following minimum requirements:
1. Storage tank - 2000 gallons. High Density Polyethylene or fiberglass.
2. Disinfection - Chlorination.

3. Hydropneumatic tank - 57 gallon capacity/125 psi.
4. Delivery pressure - 50 psi.

1.5 SUBMITTALS

A. Potable water system that meets the construction document requirements and conform to New Mexico requirements shall be submitted for review. Drawings shall be sealed by New Mexico registered engineer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Hydropneumatic tank and storage tank shall be leakage factory tested prior to shipping. Test report shall be supplied to Contracting Officer.

B. Protect equipment and pipe during transit. Do not accept any equipment and material damaged during transit.

C. Store equipment and pipe in a safe environment. Equipment scheduled for installation in building shall be stored in a similar environment that would not cause damage to equipment.

PART 2 PRODUCTS

2.1 CORROSION

A. All buried material will consist of corrosive resistant plastic or fiberglass material unless authorized by Contracting Officer. Material shall meet applicable AWWA standards.

B. Pipe and fittings for connection to water delivery truck shall be stainless steel with threaded cap attached to pipe at receiving end.

PART 3 EXECUTION

3.1 Install per drawings and manufacturer's instructions.

3.2 Test and disinfect per AWWA and EPA Standards for drinking water.

PART 4 PAYMENT

4.1 Payment will be made at the lump sum price included in the bid schedule. The price will include all work in this section.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

SECTION 11200 BRINE STORAGE TANKS AND CONTAINMENT STRUCTURE

PART 1 GENERAL

1.1 DESCRIPTION: This work of this section consists of the following work:

A. Designing furnishing, installing, and testing three brine storage tanks.

B. Constructing reinforced concrete foundation for the storage tanks.

C. Constructing reinforced concrete watertight perimeter wall and slab on grade.

D. Constructing a sump; furnishing, installing and testing submersible pump; instruments and control, and power supply.

E. Furnishing, installing, and testing piping and valves.

F. Other miscellaneous structures, grating, ladders and stairs.

1.2 RESPONSIBILITY FOR DESIGN:

A. The design of the brine storage tank is the responsibility of the Contractor. Comply with ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessel.

B. Design for lateral loads based on Seismic Zone 1 and wind speed 80 miles per hour in accordance with Uniform Building Code, latest edition. Seismic design shall be for tanks full and wind loads for tanks empty.

C. The design of the foundation was based on a maximum of 1 kip per foot uplift at the centerline of the pedestal. Contractor may propose alternative size tank(s). Contractor is advised that the Authority will not pay for the redesign or any additional construction cost associated with Contractor's proposal to substitute alternative tanks.

D. All design computations and drawings shall be prepared under the supervision of or by a New Mexico registered engineer and sealed prior to submittal to Contracting Officer.

1.3 SUBMITTALS

A. Shop/fabrication drawings.
   1. Reinforcing steel.
   2. Storage tank fabrication, erection and corrosion protection.

B. Data and Information.
   1. Base shear and uplift computations for storage tanks.
   2. Submersible pump data.
   3. Grating and cover plate.

1.4 RELATED SECTIONS:

A. Section 02225: Structural Excavation and Backfill.

B. Section 03301: Structural Concrete.

C. Instrumentation and Control.

D. Section 15064: Discharge Line.

PART 2 PRODUCTS

2.1 Structural Concrete: Section 03301.

2.2 Impervious Clay Blankets: Nonexpansive clays with a maximum plasticity index of 18, free of organic, frozen, and other deleterious material compacted to 95 percent Standard Proctor.

2.3 Bedding Material: Section 02221, Type BD-2, consolidated to 75 percent relative density.

2.4 Stainless Steel Handrail: ASTM E985. Weld using stainless steel electrodes per AWS D10.4.

2.5 SUBMERSIBLE PIPE AND RELATED EQUIPMENT AT STORAGE FACILITY

A. Requirements: Furnish and install 1 submersible non-clog wastewater pump. Each pump shall be equipped with a 1.9 HP, submersible electric 3750 RPM motor connected for operation on 460 volts, 3 phase, 60 cycle, with submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA approval. The pump shall be supplied with a stainless steel discharge connection and be capable of delivering 65 GPM at 36.2 TDH. An additional point on the same curve shall be 100 GPM at 14.9 feet total head. Shut off head shall be 62 feet (minimum). Each pump shall be fitted with stainless steel chain or stainless steel cable. For the working load of the lifting system shall be 50% greater than the pump unit weight. Pump and related equipment shall be suitable for brine solution. The submersible pump and related equipment shall be Model bs-3041(SS) pump WITH #252 impeller as manufactured by Flygt or approved equal.

B. Pump Design: The pump shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal-to-metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor.

C. Pump Construction: Major pump components coming in contact with the pumped media shall be stainless steel. Al exposed nuts or bolts shall be AISI type 304 stainless steel construction.

1. Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Viton ribber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.
2. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

D. Cooling System: Each unit shall be provided with an adequately designed cooling design. The water jacket shall encircle the stator housing; thus, providing heat dissipation for the motor. Impeller back vanes shall provide the necessary circulation of the cooling liquid through the water jacket. The cooling medial channels and ports shall be non-clogging by virtue of their dimensions. Provisions for external cooling and seal flushing shall also be provided.

E. Cable Entry Seal: The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal.

F. Motor: The pump motor shall be induction type with a squirrel-cage rotor, shell type design, housed in an air-filled, watertight chamber, NEMA B type. The stator windings and stator leads shall be insulated with moisture resistant Class F insulation rated for 155° C(311F). The stator shall be dipped and baked three times in Class F varnish and shall be heat-shrink fitted into the stator housing. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of up to 15 evenly

spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator lead coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and pump shall be designed and assembled by the same manufacturer.

1. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 5%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C.
2. The power cable shall be sized according to the NEC and ICEA standards and shall be sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet.
3. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

G. Bearings: The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper and lower bearings shall be single row, deep groove ball bearings.

H. Mechanical Seal: Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in an lubricant reservoir that hydrodynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating ceramic ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary ceramic seal ring and one positively driven rotating carbon seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable.

1. The following seal types shall not be considered acceptable nor equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. Cartridge type systems will not be acceptable. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.
2. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be

easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

Seal lubricant shall be FDA approved, nontoxic

I. Pump Shaft: Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be AISI type 329 stainless steel.

J. Impeller: The impeller(s) shall be stainless steel, dynamically balanced, non-clogging design having a long throughlet without acute turns. The impeller(s) shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in wastewater. Impeller(s) shall be, retained with an Allen head bolt shall be capable of passing a minimum ½ inch diameter solid.

K. Volute: Pump volute(s) shall be single-piece stainless steel, non-concentric design with smooth passages large enough to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified.

L. Protection: All stators shall incorporate thermal switches in series to monitor the temperature of each phasing winding. At 125°C (260°F) the thermal switches shall open, stop the motor and activate an alarm.

2.6 SUBMERSIBLE PUMP AND RELATED EQUIPMENT

A. Accessories: the following accessories shall be included for the pump installation:

1 EA	Discharge Connection 3" 316 Stainless Steel Construction
1 EA	Set Discharge Connection Hardware (Anchor Bolts) 316 Stainless Steel
1 EA	Upper Guide Bracket Assembly 316 Stainless Steel
1 EA	20' Lifting Chain Assembly, Stainless Steel
1 EA	Chain Fitting Kit, Stainless Steel
1 EA	Cable Holder, Stainless Steel for Suspending Liquid Level Floats

B. Liquid level float controls: pump operation shall be controlled by liquid level sensors mounted in the wet well. The mechanical switch shall be contained in a polypropylene casing resistant to the corrosive action of the salt brine liquid. The float controls shall be suitable for operating in salt brine liquid ranging in specific gravity between 1.0 and 1.1. The controls shall be model ENM-10 liquid level sensors as manufactured by ITT Flygt or approved equal.

C. Pump Controls: the pump control panel shall include the following:

NEMA 4 Watertight Enclosure
Designed for Operation of 3.6 HP Motor on 460/3/60 Power Supply
Supply
120 VAC Control Transformer
H-O-A Selector Switch
Terminals for 120 VAC Liquid Level Float Switches
Run Indicator Light
High Water Alarm Light
High Water Alarm Horn
Inner Door w/Lockable Blank Front Outer Door

2.7 Grating, Cover Plate and Supports: Protruded fiberglass with minimum design live load capacity of 100 psf. Provide course epoxy grit to all walking surface. Minimum open area of grating shall be 50 percent.

2.8 Anchor Bolts: Stainless steel conforming to ASTM A593, Type 304.

2.9 Instrumentation and Control.

PART 3 EXECUTION

3.1 Structural Excavation and Backfill. In addition to the requirement of Section 02225, the following shall apply:

A. The site shall be proof rolled after excavation with pneumatic tire front end loader with minimum load of 6 kips per axle. Soft spots will require replacement and recompaction

B. The tolerance for finished grade at the storage tank platform is 0_1+ ½ inches with the finish grade matching the top of the fiberboard at the pedestal and 0 to + ½ inch at centerline tank.

3.2 All pipe penetrations through walls and slab shall have a seep collars located 1" clear of reinforcing steel for structures with reinforcing steel located at center line wall or at center of wall and slab.

3.3 Waterstops shall be welded at all joints and intersections following manufacturer's recommendations. Contracting Officer shall be notified following waterstop installation and prior to forming and concreting.

3.4 An embedded steel template to hold anchor bolts accurately in place shall be provided for the installation of storage tank anchor bolts. The plate shall be located a minimum of 2 inches below the top of concrete pedestal.

3.5 No construction joint other than that shown on the drawings will be permitted. All construction joints shall be water tight.

3.6 Pumps shall be installed per manufacturer's recommendation. Locate anchor bolts per pump manufacturer anchor bolt layout.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Horizontal louver blinds, hardware, accessory items, mounting brackets, and fastenings for exterior glazed units in the building.

1.2 SUBMITTAL FOR REVIEW

A. Samples: Submit color deck showing color range and finish of blinds for color selection.

PART 2 MATERIALS

2.1 PRODUCTS: Horizontal louver blinds with lifetime warranty equal to Monaco 1-inch blind by Levolor, 4110 Premier Drive, High Point, NC 27265.

2.2 SLATS: Spring tempered aluminum slats with rounded corners and forming burrs removed, not less than .006-inch thick and 1-inch wide.

2.3 HEADRAILS: Manufacturer's standard U channel fabricated from minimum 0.025-inch thick sheet steel, with cross bracing for rigidity, equipped with top brace, end braces, top cradle, and installation accessories, and color to match slats.

2.4 BOTTOM RAIL: Manufacturer's standard tubular steel bottom rail with contour top to match slats, reinforced to prevent twisting or sagging, closed ends, and color to match slats.

2.5 LADDER (SLAT SUPPORT): Standard polyester support cords with integrally braided ladder rungs and spacing to match slats.

2.6 TILTER: Standard enclosed, lubricated, tilting mechanism which will hold slats at uniform angle and will tilt slats in a 180° range.

2.7 CORDS: Standard braided high-strength polyester or nylon cord equipped with soft-molded plastic, rubber, or composition tassels securely attached to cord end.

2.8 CORD LOCKS: Standard crash proof rolling type locks with cord separators attached to headrail and designed to hold blind in fully raised position.

2.9 HARDWARE: Standard brackets, supports, and internal reinforcement to suit blind size and color to match rails.

2.10 FINISH: Galvanize and phosphate coat steel parts, followed by standard glass smooth, baked-on synthetic resin enamel finish. Prime aluminum slats with chromate conversion coating, followed by standard glass smooth, baked-on synthetic resin enamel finish.

PART 3 EXECUTION

3.1 INSPECTION: Check that surfaces to which work will be secured are sound and free of irregularities interfering with installation. Do not begin installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION: Install blinds and shades in accordance with manufacturer's installation procedures. Assure adequate clearance to permit unencumbered operation. Position units plumb and true, and securely anchor in place with brackets, clips, and fasteners.

3.3 ADJUSTMENT: Adjust clearances and overlaps to ensure free operation. Replace damaged items and repair surfaces damaged by improper installation.

3.4 CLEANING: Remove protective coverings and devices. Clean soiled components and leave work site free of debris.

PART 4 COST

4.1 COST

A. The lump sum bid price for the injection well facility shall be full compensation for furnishing all the materials, labor, equipment, tools, supplies and incidentals necessary to complete the work in a workmanlike and acceptable manner. all work not specifically identified for payment in the bid schedule is and shall be considered incidental to the cost of the injection well facility. The Contractor shall include in his price an amount sufficient to compensate him for all incidentals. The Contractor shall furnish the injection well facility as a complete and operable facility.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

A. The work included in this section consists of furnishing, installing and testing of corrosion resistant piping, fittings, and appurtenances of a pressure system that conveys brine from production wells located along the Canadian River to the storage tanks at the injection well site. The discharge line consists of 6" high density polyethylene pipe. The manifold consists of 4" high density polyethylene pipe.

1.2 RELATED SECTIONS

A. Section 02223 - Utility Crossing of State Highway

B. Section 02110 - Clearing and Grubbing

C. Section 02120 - Diversion and Care of River

D. Section 02151 - Shoring

E. Section 02221 - Utility Trenching and Backfill

F. Section 02222 - Angle Drilled Discharge Line

G. Section 02229 - Utility Line Marking

H. Section 02251 - Roadway Construction

1.3 SUBMITTALS

A. Certification and Testing - Section -01300.

B. Shop Drawings - Section 01300.

PART 2 PRODUCTS

2.1 MATERIALS

A. High Density Polyethylene Pipe and Fittings - ASTM D-1248 and ASTM D-3350.

PART 3 EXECUTION

3.1 Training - All personnel responsible for fusion welding of the high density polyethylene pipe shall be factory trained. Certificate of training shall be provided to Contracting Officer prior to initiating work.

3.2 Examination, Storage and Inventory of High Density Polyethylene Pipe - All pipe delivered to the job site shall be marked and stored by pressure rating. Pipe shall be examined by Contractor. All damaged pipe or pipe without proper identification shall be returned and replaced. Contractor shall keep a record of classes of pipe placed and submit to Contracting Officer at the end of each week during pipe installation.

3.3 Handling: Comply with manufacturer's recommendation.

3.4 PREPARATION

A. Procedures for fusion welding shall be submitted to Contracting Officer before work is initiated. Manufacturer shall certify procedure proposed meets quality central standards.

B. Fusion welding machine and tools shall be checked. No work shall proceed with faulty equipment.

C. Trench conditions shall be examined prior to laying pipe. All soft trench bottom and walls shall be removed and corrected.

3.5 INSTALLATION

A. Joint preparation, fuse welding, and cooling period shall comply with manufacturer's process and procedures.

B. Install pipe in prepared trench making allowance for elongation and shrinkage resulting from differential temperatures of exposed pipe and buried pipe.

C. Support pipes in vaults and manholes to centerline elevations and as shown in utility crossing of state highway and angle discharge line drawings.

3.6 TESTING

A. Hydrostatically test pipe at the rated pressure following manufacturer's recommendations. Test shall be in two phases, on initial expansion phase and test phase. Test shall be performed using non-monitored make up water test. Pressure must be steady and within 5% of target value for acceptance. Pneumatic testing will not be permitted.

PART 4 PAYMENT

4.1 PAYMENT

A. Payment will be based on linear foot of pipe installed per the price included in the bid schedule and will include all work including trenching and backfill, clearing and grubbing, shoring and other related work except for discharge line included in the valve vaults, angle drilled discharge line and utility crossing of state highway.

END OF SECTION