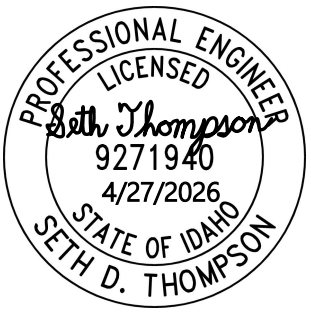
BIDDING DOCUMENTS, CONTRACT DOCUMENTS,
STANDARD SPECIFICATIONS
AND
SPECIAL PROVISIONS

FOR THE

BIRCH CREEK WATER PROJECT



Prepared by:

Sunrise Engineering
2100 N Main St,
North Logan, UT 84341
Tel: (435) 563-3734

Seth Thompson, P.E.
State of Idaho
Project Engineer
Date: 4/27/2026

Section No. of Pages

TABLE OF CONTENTS
FOR
SUNRISE ENGINEERING
STANDARD SPECIFICATIONS FOR CONSTRUCTION

CONTRACT DOCUMENTS

CONTRACT DOCUMENTS

INVITATION TO BID

Separate sealed bids for construction of Birch Creek Water Project will be received for the Birch Creek Culinary Water Company, INC. at Sunrise Engineering: 2100 N Main St, North Logan, UT 84341. Bids will be publicly opened and read aloud at 9:00 AM on Wednesday, May 20, 2026 at 2100 N Main St, North Logan, UT 84341.

The work to be performed under this project shall consist of furnishing all labor, materials and equipment required to construct the facilities and features called for by the CONTRACT DOCUMENTS and as shown on the DRAWINGS.

This project is funded by Idaho Drinking Water State Revolving Fund (SRF).

Plans and specifications have been prepared by Sunrise Engineering, LLC. and will be available after April 27, 2026, on their website plan room at http://www.sunrise-eng.com. Click on "Plan Room" at the top right of the homepage. Bidders must register and sign-in and choose to become a plan holder to obtain access to CONTRACT DOCUMENTS and DRAWINGS. Notices regarding changes/amendments to the CONTRACT DOCUMENTS and DRAWINGS will be sent to the e-mail address associated with the bidder's registration. Bidders are responsible for maintaining current and correct contact information and check the plan room often to receive updates or additional documents/changes/amendments. The ENGINEER for this Contract will be Sunrise Engineering, and they will be represented by Seth Thompson as Project Engineer.

A pre-bid tour will be held on Wednesday, May 6, 2026, at 9:00 AM, leaving from the Church of Jesus Christ of Latter-day Saints at 7316 N Capitol Hill Rd, Preston, ID 83263. Attendance at the pre-bid tour is mandatory. Names of those in attendance will be recorded.

No questions will be received by the ENGINEER after Friday, May 15, 2026, at 12:00 PM.

The prevailing rate of wages, as determined by the U.S. Secretary of Labor, in accordance with the Davis-Bacon act, shall be paid for each craft or type of labor needed to perform the contract. This is also an Equal Employment Opportunity (EEO) project. Bidders on this project will be required to comply with the President's Executive Order No. 11518, 11246, and 11375, as well as other Federal Regulations indicated in the CONTRACT DOCUMENTS. Bidder's will also be required to comply with the Public Works Contractors License Act and the Public Contracts Bond Act, Title 54, Chapter 19, Idaho Code, including requiring the prime construction contractor retained for construction to carry performance and payment bonds equal to one hundred percent (100%) of the contract price.

INSTRUCTION TO BIDDERS

Complete sets of Bidding Documents may be obtained from the ENGINEER as designated in the Advertisement or Invitation to Bid. Complete sets of Bidding Documents, which include all contract forms, specifications, special provisions, drawings, and any addenda issued during bidding shall be used for preparing BIDS. Neither the OWNER nor ENGINEER assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

Each BID must be submitted in a sealed envelope addressed to: Birch Creek Culinary Water Company, INC. at 2100 N Main St, North Logan, UT 84341. Each sealed envelope containing a BID must be plainly marked on the outside as "BID for Birch Creek Water Project" and the envelope should bear on the outside the name of the BIDDER, their address, license number if applicable, and the name of the project for which the BID is submitted.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 60 days after the date of the BID opening. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. All bids will be checked by the ENGINEER for errors. If errors are made, unit prices shall govern and corrections will be made according to the unit price or lump sum amounts and totals will be revised to reflect the corrections.

The OWNER shall provide to BIDDERS prior to BIDDING all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

This WORK will be constructed by award of a competitive, sealed bid contract awarded to the lowest responsible, responsive bidder. Compensation to the CONTRACTOR will be made through progressive monthly payments in accordance with the General Conditions of these CONTRACT DOCUMENTS at the units and prices indicated in the BID Schedule.

When construction under this contract takes place on property owned or administered by agencies or organizations other than the OWNER, all construction shall be done in accordance with the special requirements of that entity which are contained or referenced in these CONTRACT DOCUMENTS

When requirements published by such entities are contained in or referenced by these CONTRACT DOCUMENTS, they shall be carefully complied with and the CONTRACTOR shall include sufficient compensation to cover the WORK required therein.

Information will be provided on the DRAWINGS and in these documents to indicate areas of WORK which fall on property owned or administered by agencies or organizations other than the OWNER.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve CONTRACTOR from fulfilling any of the conditions of the contract.

Each BID must be accompanied by the completed FORM BABA-1 included in the CONTRACT DOCUMENTS.

Each BID must be accompanied by a BID BOND payable to the OWNER for five percent of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible, responsive BIDDERS. When the Agreement is executed, the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the PAYMENT BOND and PERFORMANCE BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

A PERFORMANCE BOND and a PAYMENT BOND, each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or PAYMENT BONDS and PERFORMANCE BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the PERFORMANCE BOND and PAYMENT BOND, when required, within ten (10) calendar days from the date when the NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may, at their option, consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

Within ten (10) days of receipt of the Agreement signed properly by the party to whom the contract was awarded, and accompanied by acceptable PERFORMANCE and PAYMENT BONDS, when required, the OWNER shall sign the Agreement and return to the BIDDER an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw their signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make such investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Award will be made to the lowest responsible, responsive BIDDER. However, the OWNER reserves the right to reject any and all of the bids.

BIDDER and OWNER recognize that time is of the essence in this Agreement and that OWNER will suffer financial loss if the WORK is not completed within the time period specified in the Bid. OWNER and BIDDER agree that as liquidated damages for delay (but not as a penalty) BIDDER shall pay OWNER the specified amount for each day that expires after the specified time for substantial completion until the WORK is substantially complete.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to his BID.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when requested to do so by the OWNER.

BID

Bid of _____
(Insert Contractor's Name)

(hereinafter called "BIDDER"), organized and existing under the laws of the State of _____
(Insert State)

and doing business as _____ to
(Insert "a corporation", "a partnership" or "an individual" as applicable)

Birch Creek Culinary Water Company (hereinafter called "OWNER").

In compliance with the Invitation to Bid, the BIDDER hereby proposes to perform all WORK for construction of the Birch Creek Water Project in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below in the BID Schedule.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID, each party thereto certifies as to their own organization, that this BID has been prepared independently, without consultation, communication, or agreement as to any matter relating to the BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this Contract on or after a date specified in the NOTICE TO PROCEED and to fully complete the CONTRACT within ninety (90) consecutive calendar days ("Performance Period"). The Performance Period shall begin on the date the CONTRACTOR commences on-site construction activities, which date shall be documented in writing. The CONTRACTOR may, at its discretion and with prior written approval of the ENGINEER, suspend the WORK one (1) time during the Performance Period. The total contract time, including any approved suspension, shall not extend beyond November 1, 2026.

BIDDER further agrees to pay as liquidated damages the sum of $2,500.00 for each consecutive calendar day thereafter as provided in Section 15 of the GENERAL CONDITIONS.

This BID will remain open for 23 days after the date of Bid Opening. If awarded the Contract, the BIDDER will sign the Agreement and submit the security and the other documents required by the CONTRACT within ten (10) days after the date of the OWNER'S "Notice of Award".

BIDDER acknowledges receipt of the following ADDENDA:

_____

_____

The BID Schedule is provided on the following page. The BID Schedule must be completed in full by the BIDDER and signed properly to be considered responsible.

BID SCHEDULE

CONTRACT FOR: Birch Creek Water Project

The undersigned Bidder, having examined and determined the scope of the Contract Documents, hereby proposes to perform the work described herein for the following unit prices or lump sum amounts.

Note: ***Bids shall include sales tax and all other applicable taxes and fees.***
All bids shall be checked for errors. If errors are made, unit prices shall govern and corrections will be made according to the unit price

No.	Meas. & Pmt.	Item	Quantity	Unit	Unit Price	Amount
		General Project Items				
1	02000	Mobilization	1	L.S.		
2	02005	Traffic Control	1	L.S.		
3	02020	Subsurface Investigation - Main Line	6	HR		
4	02020	Subsurface Investigation - Service Lines	18	HR		
5	SP 02200	Dewatering	10	DAYS		
6	02510	Material Sampling and Testing	1	L.S.		
		Demolition and Surface Restoration				
7	02520	Sawcutting Asphalt	1,000	LN.FT.		
8	02500	Remove Bituminous Surface	444	SQ.YD.		
9	02500	Replace 3" HMA PG 58-34 Bituminous Surface	444	SQ.YD.		
10	02500	Remove & Replace Chain Link Fence	20	LN.FT.		
11	02500	Remove & Replace Stock Fence and Gates	153	LN.FT.		
12	SP 02900	Field Seed Mix Material for Trenching	0.6	Acre		
13	SP 02900	Restore Landscaping Parcel RP03956.01	1	L.S.		
		Main Line Replacement and Appurtenances				
14	02222	Install 4" DR25 C-900 PVC Pipe	5,850	LN.FT.		
15	02222	Install 24" DR25 C-900 PVC Pipe	160	LN.FT.		
16	02320	Piped Encasement (10" Corrugated HDPE)	30	LN.FT.		
17	SP 15110	Connect 24” Pipe to 4” Pipe	2	EA		
18	SP 15110	Install New Spring Box Intake Pipe	1	L.S.		
19	02250	Install Clay Cutoff Wall at Water Crossings	6	EA		
20	SP 15110	Install Riprap at Creek Crossing	2	EA		
21	15232	Install 1" Combination Air/Vacuum Valve (24" Tap)	1	EA		
22	15232	Install 1" Combination Air/Vacuum Valve (Tank)	2	EA		
23	SP 15110	Install Main Line Drain Pipe & End Protection	1	L.S.		

24	SP 15110	Install Tank Drain Pipe End Protection	1	L.S.		
25	SP 15110	Install Tank Overflow Air Gap Assembly	1	L.S.		
26	15230	Install 4" Gate Valve - Inside Tank	4	EA		
27	15230	Install 4" Gate Valve - Outside Tank	4	EA		
28	SP 15110	Connect to Existing Pipe	7	EA		
29	01019	Install Spill Containment Pallet	1	L.S.		
Service Connections						
30	SP 15234	Install 1" Service Connection	10	EA		
31	15234	Install 1" Service Meter Assembly	40	EA		
32	15234	Install Water Meters	40	EA		
Spring Protection						
33	SP 02015	Clear and Grub Spring Surroundings	1	L.S.		
34	SP 02210	Install Cutoff Ditch	200	LN.FT.		
35	02900	Re-seeding Spring Surround	0.1	Acre		
36	SP 02210	Install Erosion Control Mat Spring Surround	2,750	SQ.FT.		
					BASE BID TOTAL	

Bid Alternate 1: Additional Spring Protection						
37	SP 02210	Strip and Replace 6" Topsoil for Spring Liner	300	SQ.YD.		
38	SP 02210	Install 40 Mil HDPE Spring Liner	2,750	SQ.FT.		
39	SP 02210	Install 1' Thick Spring Clay Liner	300	SQ. YD.		
40	SP 02900	Re-Seeding Labor for Trenching	0.6	Acre		
					BID ALTERNATE 1 TOTAL	

The undersigned Bidder certifies that this proposal is made in good faith, without collusion or connection with any other person or persons bidding on the work.

Seal (if bid is by Corporation)

Respectfully Submitted:

Bidder: _____

Signature _____

Title: _____

License No. _____ Address: _____

Date: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
(CONTRACTOR'S NAME)
as Principal, and _____,as Surety, are hereby
(SURETY'S NAME)
held and firmly bound unto Birch Creek Culinary Water Company, INC.
as OWNER in the penal sum of
(OWNER'S NAME)
_____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this _____ day of _____, 20____.

The Condition of the above obligation is such that whereas the Principal has submitted to _____ _____a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for _____.

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a bond or bonds as may be specified in the CONTRACT DOCUMENTS with surety acceptable to the OWNER and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L.S.)
(Principal)

_____
(Name of Surety)

By: _____
(Signature)

IMPORTANT: Surety companies executing BONDS 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.

AGREEMENT

THIS AGREEMENT, made on _____between Birch Creek Culinary Water Company, INC., hereinafter called "OWNER" and _____, doing business as a _____ hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the construction of:

Replacing approximately 6,000 feet of water line for the Birch Creek culinary distribution system along with appurtenant improvements. Additional improvements including spring protection measures and a chlorine contact time piping system.

2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR shall commence the WORK as specified in the NOTICE TO PROCEED and shall achieve Substantial Completion within ninety (90) consecutive calendar days ("Performance Period"), commencing upon the start of on-site construction activities as approved by the ENGINEER. The CONTRACTOR shall schedule the WORK such that the Performance Period is completed no later than November 1, 2026, unless otherwise extended by the CONTRACT DOCUMENTS. The CONTRACTOR may, with prior written approval of the ENGINEER, suspend the WORK one (1) time during the Performance Period; however, such suspension shall not extend the required completion date.

4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of $_____, or as shown otherwise in the BID schedule.

5. The term "CONTRACT DOCUMENTS" means and includes the following:

(A) INVITATION TO BID
(B) INSTRUCTION TO BIDDERS
(C) BID AND BID SCHEDULE
(D) BID BOND
(E) AGREEMENT
(F) PERFORMANCE BOND
(G) PAYMENT BOND
(H) SPECIAL PROVISIONS
No. SP02015 No. SP02200 No. SP02210 No. SP02900
No. SP15110 No. SP15230 No. SP15234 No. _____
(I) DRAWINGS prepared by Sunrise Engineering, numbered 1 through 21 and dated April 27, 2026.
(J) STANDARD SPECIFICATIONS FOR CONSTRUCTION prepared or issued by Sunrise Engineering.
(K) ADDENDA:
No. _____, dated _____, 20____.
No. _____, dated _____, 20____.

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement on the date first above written.

OWNER: _____

BY: _____

NAME: _____

TITLE: _____

(SEAL)
ATTEST_____

BY_____

TITLE_____

CONTRACTOR: _____

BY: _____

NAME: _____

ADDRESS: _____

_____

(SEAL)
ATTEST_____

BY_____

TITLE_____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS THAT:

_____
Name of CONTRACTOR

_____
Address of CONTRACTOR

a _____, hereinafter called PRINCIPAL and
(*Corporation), (Partnership) or (Individual)*

_____
Name of SURETY

_____
Address of SURETY

hereinafter called SURETY, are held and firmly bound unto

Birch Creek Culinary Water Company, INC.
Name of OWNER

7363 E Birch Creek Road, Preston, ID 83263
Address of OWNER

hereinafter called OWNER, in the total aggregate penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, whereas the PRINCIPAL entered into a certain contract with the OWNER, dated the _____day of _____ , 20____, a copy of which is hereto attached and made a part of the construction contract for _____.
(Insert Contract Name)

NOW, THEREFORE, if the PRINCIPAL shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said CONTRACT during the original term thereof, and any extensions thereof which may be granted by the OWNER with or without notice to the SURETY and during the one year guaranty period; and if the PRINCIPAL shall satisfy all claims and demand incurred under such contract; and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so; and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that the said SURETY, for value received hereby stipulates and agrees that no change, extension or time, alteration or addition to the terms of the CONTRACT or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way 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 or to the SPECIFICATIONS.

PROVIDED FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto; upon amendment to the CONTRACT not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as amended. The term "AMENDMENT"; wherever used in this BOND and whether referring to this BOND, the CONTRACT or the LOAN DOCUMENTS shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this _____ day of _____, 20____.

PRINCIPAL'S ATTEST: _____
PRINCIPAL

By: _____

(SEAL) Address: _____

_____
Witness as to PRINCIPAL

_____
Address

SURETY'S ATTEST: _____

By: _____

(SEAL) Address: _____

_____
Witness as to SURETY

_____
Address

***PLEASE NOTE**:*

1. *Date of BOND must not be prior to date of CONTRACT.*
2. *If CONTRACTOR is partnership, all partners should execute BOND.*
3. *Surety companies executing BONDS 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.*
4. *Use of this form as an instrument of SURETY for this project is not mandatory. Use of other forms normally deemed acceptable in the State wherein the project is located may be allowed.*

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS THAT:

_____
Name of CONTRACTOR

_____
Address of CONTRACTOR

a _____, hereinafter called PRINCIPAL and
(*Corporation), (Partnership) or (Individual)*

_____
Name of SURETY

_____
Address of SURETY

hereinafter called SURETY, are held and firmly bound unto

Birch Creek Culinary Water Company, INC.
Name of OWNER

7363 E Birch Creek Road, Preston, ID 83263
Address of OWNER

hereinafter called OWNER, in the total aggregate penal sum of _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, whereas the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part of the construction contract for _____,
(Insert Contract Name)

NOW, THEREFORE, if the PRINCIPAL shall promptly make payments to all persons, firms and corporations furnishing materials for, or performing labor in the prosecution of the WORK provided for in such contract; and any authorized extensions or modifications thereof, including amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK; and for all labor costs incurred in such WORK, including that by a sub-contractor; and to any mechanic or materialman, lienholder; whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the sub-contractors and persons, firms and corporations having a direct contract with the PRINCIPAL or its sub-contractors.

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 SPECIFICATIONS accompanying the same shall in any way 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 or to the SPECIFICATIONS.

PROVIDED FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL, shall have given written notice to any two of the following: the PRINCIPAL, the OWNER or the SURETY above named within ninety (90) days after such claimant did or performed the last of the WORK or labor, or furnished the list of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the WORK or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State in which the aforesaid project is located, save that such service need not be made by a public office. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased WORK on said CONTRACT, it being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED FURTHER, it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto; upon amendment to the CONTRACT not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as amended. The term "AMENDMENT"; wherever used in this BOND and whether referring to this BOND, the CONTRACT or the LOAN DOCUMENTS shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this _____ day of _____, 20____.

PRINCIPAL'S ATTEST: _____
PRINCIPAL

By: _____

(SEAL) Address: _____

SURETY'S ATTEST: _____
SURETY

By: _____
Attorney-in-Fact

(SEAL) Address: _____

***PLEASE NOTE**:*

1. *Date of BOND must not be prior to date of CONTRACT.*
2. *If CONTRACTOR is partnership, all partners should execute BOND.*
3. *Surety companies executing BONDS 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.*
4. *Use of this form as an instrument of SURETY for this project is not mandatory. Use of other forms normally deemed acceptable in the State wherein the project is located may be allowed.*

NOTICE OF AWARD

TO: _____
(Insert Bidder's Name and Address)

_____

_____

CONTRACT FOR: Birch Creek Water Project

The OWNER has considered the BID dated May 20 , 20 26 , submitted by you for the above-described WORK in response to its Advertisement for Bids and Information for Bidders.

You are hereby notified that your BID has been accepted in the amount of [Total Bid Amount]

You are required by the Instruction to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND, and Certificates of Insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 2026.

OWNER: Birch Creek Culinary Water Company
(Name of Owner)

BY: _____
(Signature)

TITLE: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____
(Contractor)
this ____ day of _____, 20____.

By: _____
(Signature)
Title: _____

NOTICE TO PROCEED

TO: _____
(Insert Name of CONTRACTOR)

_____

_____

CONTRACT: Birch Creek Water Project

In accordance with the AGREEMENT dated _____, you are hereby notified to commence WORK on or after _____. The WORK shall be substantially completed within ninety (90) consecutive calendar days from the start of on-site construction activities, with one (1) permitted suspension of work as approved by the ENGINEER, and in all cases no later than November 1, 2026.

OWNER: Birch Creek Culinary Water Company
(Name of Owner)

BY: _____
(Signature)

TITLE: _____

DATE ISSUED _____,20____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____
(Contractor)
this ____day of_____, 20____.

By:_____
(Signature)

Title:_____

APPLICATION FOR PAYMENT

Birch Creek Water Project

CONTRACT NO. 16695

PAYMENT NO.

PAGE OF

OWNER:	**CONTRACTOR:**	**PERIOD OF ESTIMATE**
Birch Creek Clinary Water Company		**FROM:**
		TO:

CONTRACT CHANGE ORDER SUMMARY

NO.	APPROVAL DATE	AMOUNT ADDITIONS	AMOUNT DEDUCTIONS
TOTALS		$ -	$ -
NET CHANGE		$ -	

TABULATION OF PAYMENT

1. Original Contract Price	$ -
2. Change Orders	$ -
3. Revised Contract Price (1 + 2)	$ -
4. Total Value of Work Completed to Date *	$ -
5. Allowance for Materials Stored on this Date*	$ -
6. Subtotal (4+5)	$ -
7. Previously earned by Contractor (Prev. #6)	$ -
8. Value of Work Completed this Period (6-7)	$ -
9. Retainage Held Prior to this Payment (Prev. #11)	$ -
10. Retainage to be Held from this Payment (% of 8)	$ -
11. Total Retainage to be Held (9+10)	$ -
12. Payment Due Contractor this Period (8-10)	$ -

** Detailed breakdown on attached continuation sheet*

CONTRACT TIME

Original Contract Time (Days)		On Schedule	Starting Date:
Revisions		____ Yes ___ No	Completion Date:
Remaining Time (Days)			

ACCEPTED BY CONTRACTOR:

By:

Date:

ENGINEER'S CERTIFICATION:

The undersigned certifies that the work has been inspected and, to the best of their knowledge and belief, the quantities shown on this estimate are correct and the work has been performed in accordance with the contract documents.

APPROVED BY OWNER:

By:

Date:

Engineer: SUNRISE ENGINEERING

By:

Date:

Progress Estimate - Unit Price Work

Contractor's Application

For (Contract): Birch Creek Water Project	Application Number:
Application Period:	Application Date:

	A					B	C	D	E	F		
	Item		Contract Information									
SPEC No.	Bid Item No.	Description	Item Quantity	Units	Unit Price	Total Value of Item ($)	Estimated Quantity Installed/Removed	Value of Work Installed to Date	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F / B)	Balance to Finish (B - F)
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
					$ -	$ -		$ -	$ -	$ -	#DIV/0!	$ -
		Totals				**$ -**	-	**$ -**	**$ -**	**$ -**		**$ -**

Stored Material Summary

Contractor's Application

For (Contract): Birch Creek Water Project	Application Number:
Application Period:	Application Date:

A	C					D				E		F				G
												Incorporated in Work				
Invoice Number	Storage Location	Bid Item No.	Description of Materials or Equipment Stored	Contract Quantity	Invoice Quantity	Date Placed into Storage (Month/Year)	Previously stored amount	Amount ($)	Sales Tax	Amount Stored this Month ($)	Subtotal Amount Stored to Date (D + E)	Date (Month/ Year)	Quantity Installed	pipe unit price	Amount ($)	Materials Remaining in Storage ($) (D + E - F)
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -						
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
							$ -		$ -	$ -					$ -	$ -
			Totals	-	-		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**				**$ -**	-

INVOICE #	AMOUNT	DATE
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
TOTAL	$ -	

Pay App #4	AMOUNT	DATE
	$ -	
	$ -	
	$ -	
	$ -	
	$ -	
TOTAL	$ -	

CONTRACT CHANGE ORDER

ORDER NO.

DATE:

CONTRACT FOR: Birch Creek Water Project

OWNER: Birch Creek Culinary Water Company

CONTRACTOR:

You are hereby requested to comply with the following changes from the contract plans and specifications. The following Bid Items will be revised on the Contractor's Bid Schedule

Bid Item	Description of Changes (Supplemental Drawings & Specifications Attached)	Qty	Unit	Unit Price	Decrease in Contract Price	Increase in Contract Price
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
					$ -	$ -
	TOTALS					$ -

NET CHANGE IN CONTRACT PRICE

Change Order initiated by:

JUSTIFICATION:

The amount of the Contract will be increased/decreased by the sum of: $ - DOLLARS

The Contract total including this and previous change orders will be: $ - DOLLARS

The Contract period provided for completion will be (increased)(decreased)(unchanged) by:

New Completion date:

This document will become a supplement to the Contract and all provisions will apply thereto.

Requested (OWNER) _____ Date: _____

Recommended (ENGINEER) _____ Date: _____

Accepted (CONTRACTOR) _____ Date: _____

Approved _____ Date: _____

Approved _____ Date: _____

FIELD WORK ORDER

Contract for: Birch Creek Water Project

Owner: Birch Creek Culinary Water Company

Contractor: _____

You are hereby requested to: _____

SUNRISE ENGINEERING

Issued by: _____
(Signature)

_____
(Title)

_____
(Date)

ACCEPTANCE OF ORDER

Receipt of this order is hereby acknowledged by:

_____
(Contractor's Representative's Signature)

_____
(Title)

_____
(Date)

OWNER APPROVAL OF ORDER

_____
(Signature)

_____
(Title)

_____
(Date)

Note: This order is not intended to serve as a change order for this contract and does not modify the requirements thereof.
See Section 13.3 of the General Conditions, Section 00700 .

NOTICE OF SUBSTANTIAL COMPLETION

Project: Birch Creek Water Project

Owner: Birch Creek Culinary Water Company, INC.

To: CONTRACTOR

Name: _____

Address: _____

This Notice of Substantial Completion applies to all work included under the Contract Documents or to the following specified parts thereof:

(Insert description of applicable parts)

The work described above and performed under this Contract has been reviewed and found substantially complete and the date of SUBSTANTIAL COMPLETION for this work is hereby established as: _____.
The guarantee period shall commence on this date.

Definition of Date of Substantial Completion: That Date certified by the ENGINEER/ARCHITECT when the construction of the PROJECT, or a specified part thereof, is sufficiently completed in accordance with the CONTRACT DOCUMENTS so that the PROJECT, or specified part, can be utilized for the purpose for which it is intended.

A list of items to be completed or corrected, which are connected to or affected by the work described above, is attached hereto. Failure to include any items on this list does not alter the responsibility of the CONTRACTOR to complete all work in accordance with the CONTRACT DOCUMENTS. The date of commencement of guarantee for items in the attached list will be the date of final acceptance, unless agreed otherwise in writing.

SUNRISE ENGINEERING

Seth Thompson
Engineer

_____
Date

Receipt of this notice is hereby acknowledged:

_____
Contractor's Name

_____
Signature

_____
Date

NOTICE OF FINAL ACCEPTANCE

To: _____
Contractor's Name

_____
Address

_____

RE: Birch Creek Water Project
Contract Name

OWNER: Birch Creek Culinary Water Company, INC.
Name

A final inspection of the WORK completed under the Contract indicated above has been made and all WORK has been found to be completed. All known changes to the WORK have been documented and approved at this time, and to the best of our knowledge, information, and belief, the work required by this Contract has been performed and completed in accordance with the approved DRAWINGS, SPECIFICATIONS, and other CONTRACT DOCUMENTS. Final payment for the Contract has therefore been requested and should follow shortly.

Thank you for your effort and cooperation towards the successful completion of this WORK.

ENGINEER: _____
Signature

Date: _____

OWNER'S Representative: _____
Signature

Date: _____

Davis Bacon Compliance Requirements for Borrowers
Attachment B (SRF-05)

Compliance with this attachment to the loan offer will be monitored as part of the DEQ project approval process and during interim and final inspections.

1. OBTAINING WAGE DETERMINATIONS AND INCLUSION INTO PROJECT.

a. For contacts greater than $2,000, the Borrower shall obtain the wage determination for the locality in which project will take place prior to issuing advertisement for bids, proposals, quotes, or other methods for soliciting contracts (solicitation) for activities subject to Davis Bacon. Wage determinations can be found at *www.sam.gov.* These wage determinations shall be incorporated into bid documents and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.

   i. While the solicitation remains open, the Borrower shall monitor *www.sam.gov* weekly to ensure that the wage determination contained in the solicitation remains current. The Borrower shall amend the solicitation if Department of Labor (DOL) issues a modification more than 10 days prior to the closing date (i.e., bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the Borrower may request a finding from the Idaho Department of Environmental Quality (DEQ) that there is not a reasonable time to notify interested contractors of the modification of the wage determination. DEQ will provide a report of its findings to the Borrower.

   ii. If the Borrower does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless DEQ, at the request of the Borrower, obtains an extension of the 90-day period from DOL pursuant to 29 CFR 1.6©(3)(iv). The Borrower shall monitor *www.sam.gov* on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.

b. If the Borrower carries out activity subject to Davis Bacon by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the Borrower shall insert the appropriate DOL wage determination from *www.sam.gov* into the ordering instrument.

c. The Borrower shall review all subcontracts subject to Davis Bacon entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.

d. As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination

applicable to a sub recipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the Borrower has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the Borrower shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The Contractor must be compensatedfor any increases in wages resulting from the use of DOL's revised wage determination.

2. CONTRACT AND SUBCONTRACT PROVISIONS.

a. The Borrower shall insert in full, for any Contract in excess of $2,000, Davis Bacon contractual clauses contained in Supplemental Specification Insert for Idaho Drinking Water and Clean Water State Revolving Fund attached to the loan agreement or found within the Customer Handbook at *www.deq.idaho.gov/SRF.*

3. REQUEST ADDITIONAL "TRADE" CLASSIFICATIONS AND WAGE RATES

a. If a work classification(s) does not appear on the wage determination, the Borrower shall request an additional classification and wage rate. It is recommended the process be started early during the preconstruction conference. The Borrower and prime contractor for the project should identify the classification needed and recommend a wage rate through the DEQ. Requests can be approved if:

   i. The work that will be performed by the requested classification is not already performed by another classification that is already on the wage determination (e.g., if there already is an Electrician classification and wage rate on the wage determination, another Electrician classification and rate cannot be requested.)

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

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

   iv. If the contractor and laborers and mechanics to be employed in the classification (if known), and the Borrower agree on the classification and wage rate (including fringe where appropriate).

b. Requests shall be made in writing through the Borrower, including a completed Conformance Request SF 1444 Form available through DOL. The request should identify the work classification that is missing, the recommended wage rate for the classification and a copy of the project wage rate determination. The Borrower shall send the packet to DEQ for review and submission to the DOL for approval. DOL's response to DEQ will be forwarded to the Borrower.

c. If the request is denied, the Borrower will be notified what classification and rate should be used. Requesting additional classification does not delay the payroll process. It may however result in correcting underpayments (wage restitution) if

DOL is not in agreement with the request

4. PAYROLL REVIEWS

a. The Federal Copeland Act requires that workers be paid at least once a week, and without any deductions or rebates except permissible deductions such as payroll taxes, deductions the worker authorizes in writing, or those provided by court order. The Act also requires contractors to maintain payroll records and submit weekly certified payroll and statement of compliance to the Borrower certifying wages paid and deductions made. The appropriate wage rates are those determined pursuant to the federal Davis-Bacon related acts by the DOL.

b. Borrower shall review payrolls to determine if workers on the construction project have received appropriate rates of overtime compensation. The Contract Work Hours and Safety Act requires that laborers and mechanics receive overtime compensation at a rate of not less than one and one-half times their regular hourly wage after they have worked 40 hours in one week on SRF funded projects.

c. Borrower shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The Borrower shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the sub recipient shall spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract as required by paragraph 7(a). Borrower shall conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with Davis Bacon requirements. Borrower's review of shall include the following:

    i. Payrolls were submitted on time.

    ii. Forms were filled out completely including the name, identifying number, address, and job classification for each employee.

    iii. All self-employed owners, who have no employees, are designated as an employee, and are reported on the certified payroll of the prime contractor (or subcontractor if hired by them). In this instance, payroll records are completed the same as for employees and enter "self-employed" and contracting license number where the payroll asks for deductions.

    iv. If the owner of the company has employees but also performs work as a laborer or mechanic on the project covered by Davis-Bacon wage decisions, the owner must list himself as an employee on the certified payroll he submits for his employees. The payroll form is completed the same as for employees and owner is identified as "self-employed, owner or owner/operator".

    v. The wages and fringes listed on the certified payroll for each job

classification agree with those identified on the statement of intent to pay prevailing wages.

vi. The payrolls include all the classifications being utilized even if not listed on the statement of intent to pay prevailing wages.

vii. Payrolls only include permissible deductions.

viii. When fringe benefits are being paid into a benefit plan, block 4(a) on the back of the certified payroll form must be checked.

ix. Apprentices or trainees listed on the certified payroll are working under approved apprenticeship and training agreements. Copies of those certifications should be included with payrolls.

x. The payroll form is signed.

5. CONDUCT ON-SITE REVIEWS

a. The Borrower, or its representative, must provide for visits to the construction site to determine that:

i. Wage determinations are posted at the job site.

ii. Employees are working within the proper job classification.

6. CONDUCT EMPLOYEE INTERVIEWS

a. If there is reason to suspect contractor noncompliance, the Borrower or its representative must conduct employee interviews with at least one employee in each trade to determine the following:

i. Employees are being paid the amounts/rates stated on the payrolls.

ii. Employees are being properly compensated for overtime hours.

iii. Employees are receiving their full wages and fringe benefits and are not being subjected to coercion or kickback tactics by the contractor or subcontractors.

iv. Contractors and subcontractors are using and paying apprentices and trainees appropriately.

b. The Borrower shall use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. SF1445 is available from DOL.

c. The Borrower must immediately report potential violations of the Davis Bacon prevailing wage requirements to DEQ project manager, and if directed by DEQ project manager, appropriate EPA and DOL contacts.

7. SUBMIT FIRST WEEK LABOR STANDARDS (21 DAY LABOR PACKET)

a. For each prime and subcontractor performing work on-site during the first week of construction, the Borrower must provide a copy of the following documents to the DEQ project manager, within 21 days after the contractors start construction on the project.

i. Certified payroll for the first week's pay period and Borrower's analysis and opinion of compliance with Davis Bacon requirements.

ii. Employee interview forms for the first week (if there is a reasonable doubt

that any contractor is not fully complying with DB prevailing wages)

b. The purpose for submitting the above information to DEQ is to assure that any underpayments are detected early, and appropriate corrections made early while easy to implement. The first week labor standards (21 day) packet must be provided to DEQ, and any underpayments resolved before DEQ will pay the construction reimbursement request. If underpayments are discovered, DEQ will notify the Borrower to work with the prime contractor to have wage restitution made and a corrected certified payroll submitted to DEQ for approval.

8. RESOLVE OVERTIME VIOLATIONS

a. If the prime contractor or subcontractors do not compensate a worker appropriately for overtime, the Borrower shall notify DEQ and work with the prime contractor to resolve the overtime violations.

i. If the violation is less than $10 per worker, the violation does not have to be reported.

ii. If the violation is $10 or more per worker, the prime contractor must make payment or assure payments are made by subcontractors and submit a corrected certified payroll and a copy of the check to the worker and send it to the Borrower. Any time the violation is $10 to $999, the Borrower must notify DEQ in writing. If the violation is $1,000 or more, the Borrower must submit a Labor Standards Enforcement Report to DEQ who will coordinate the violation with the DOL or EPA (contact DEQ for assistance in filing this report).

9. RESOLVE OTHER UNDERPAYMENTS

a. If a mathematical error, misclassifications, or other error that results in the underpayment of wage or fringe benefits occurs, the prime contractor or subcontractor must make wage restitution and submit a corrected certified payroll and a copy of the check showing the underpayment made to the worker, to the Borrower.

10. MAINTAIN PROJECT RECORDS

a. The Borrower is required to maintain project records that document all financial, monitoring and inspection transactions, and progress reviews that occur during the life of the project. Borrowers must maintain copies of weekly certified payrolls and any corrected certified payrolls, copies of correspondence and resolution of overtime violations, and copies of employee interviews in the project files for a minimum of three (3) years after final completion of the project.

"General Decision Number: ID20260109 01/23/2026

Superseded General Decision Number: ID20250109

State: Idaho

Construction Type: Heavy

Counties: Bannock and Franklin Counties in Idaho.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/02/2026
1	01/23/2026

ELEC0291-005 12/01/2024

	Rates	Fringes
ELECTRICIAN	$ 42.25	6%+16.30

ENGI0302-006 01/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Crane)	$ 36.98	20.50

* ENGI0302-011 06/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Backhoe/Excavator/Trackhoe)	$ 36.14	16.10

IRON0014-007 07/03/2025

	Rates	Fringes
IRONWORKER	$ 43.40	30.27

LABO0155-011 06/01/2022

	Rates	Fringes
LABORER (Common or General)	$ 34.25	13.80

TEAM0983-004 01/01/2025

	Rates	Fringes
TRUCK DRIVER (Dump Truck)	$ 35.60	17.00

SUID2021-010 04/27/2023

	Rates	Fringes
CARPENTER	$ 24.00	2.62

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

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

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in

processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

==========

END OF GENERAL DECISION"

Supplemental Specification Insert for Idaho Drinking Water and Clean Water State Revolving Fund Loan Attachment C (ENG-03)

A. GENERAL

1. The requirements contained herein apply to all projects either partially or completely funded by the Drinking Water State Revolving Fund and/or Clean Water State Revolving Fund (DWSRF or CWSRF) Program. In the event of conflict with other requirements contained elsewhere, the requirements contained herein shall control.
2. All applicable federal, state, and local laws shall be complied with during bidding and construction. The Contractor is responsible for its own and its employees' acts or omissions under the laws and the contract and are jointly and equally responsible for the acts and omissions of their employees.
3. Copies of all documentation required by this specification insert shall be kept by the Owner, who shall maintain the records until three years of loan repayments have occurred.

B. MAINTENANCE OF EXISTING TREATMENT WORKS DURING CONSTRUCTION

1. Where construction consists of replacement or modification to any existing supply or distribution line, pumping facility or water treatment works, the Contractor shall provide for the maintenance of the works' conveyance of water and its existing level of treatment at all times during construction, unless otherwise specified within these specifications.

C. ACCESS

1. The Contractor shall provide for access to all sites of contract work for representatives of the Environmental Protection Agency (EPA) and the state Department of Environmental Quality (DEQ).

D. BONDING REQUIREMENTS

1. For construction or facility improvement contracts exceeding $100,000, the minimum requirements shall be as follows:
    a. Bid guarantee: a bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.
    b. Performance bond: a performance bond on the part of the Contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the Contractor's obligations under such contract.
    c. Payment bond: a payment bond on the part of the Contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure

payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

E. SAFETY: Contractor is solely responsible for ensuring safety standards at the project site and for ensuring that all work will be conducted in a manner consistent with Occupational Safety and Health Administration Safety and Health Standards, 29 Code of Federal Regulations (CFR) Part 1926.

F. OPTIONAL PROJECT SIGN: A DEQ SRF project sign is not required for the project. If the Contractor is required elsewhere in the Contract to provide a project sign, then the project sign shall be in substantial conformance with DEQ SRF sign specifications below.

1. DEQ SRF SIGN SPECIFICATIONS:

   a. The project sign shall be in accordance with DEQ SRF sign template provided by DEQ to the Owner. Exhibit 1 below is provided as an example. The Contractor shall coordinate with the Owner to secure sign specific to this Project. Any additional information displayed on the sign should not detract from or displace the information required.

   b. The sign shall be constructed of 4 feet by 8 feet exterior type high-density overlaid plywood or other sign material of equivalent quality and framed with 2 inch by 4 inch wood of suitable grade.

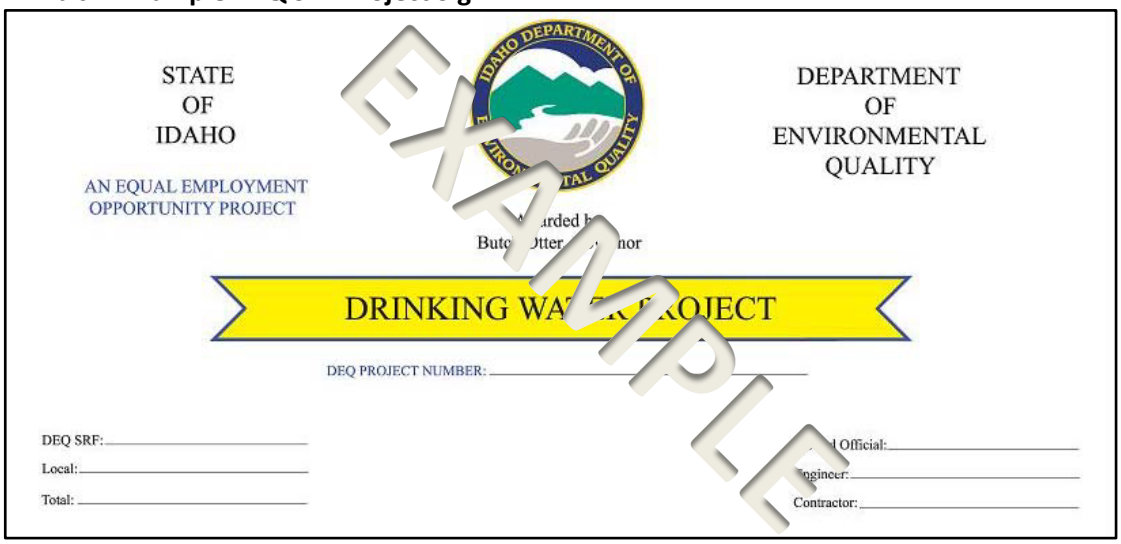
   c. The DEQ logo shall be 11 inches in diameter.

   d. The sign shall be painted with black or other visible dark lettering on a white background. Lettering shall be of professional quality and all lettering should be in proportion to the sizes shown.

   e. The Contractor should provide adequate support for the sign with regard to site conditions and it should be an adequate distance above the prevailing grade to permit public viewing.

   f. When the project is ready for final payment and accepted by DEQ, the Contractor shall remove and appropriately dispose of or reuse the sign unless otherwise required by the Contract.

Exhibit 1: Example DEQ SRF Project Sign



G. SRF CONTRACT REQUIREMENTS: The following clauses shall be included as part of these specifications and thereby incorporated into the construction Contract:

1. PRIVITY OF CONTRACT: The construction Contract is funded in part with funds from the EPA and DEQ. Neither the United States, the State of Idaho nor any of its departments, agencies, or employees is, or will be a party to the construction Contract or any lower tier contract.

2. AUDIT ACCESS TO RECORDS:

   a. The Contractor (the person or entity under contract with the Owner to perform the work partially or fully paid for with DWSRF and/or CWSRF) shall maintain books, records, documents, and other evidence directly pertinent to performance on DWSRF and/or CWSRF-funded work under this contract in accordance with generally accepted accounting principles and practices consistently applied, and the applicable DEQ regulations in effect on the date of execution of this construction contract. The Contractor shall also maintain the financial information and data used in the preparation or support of any cost submission required under applicable regulations for negotiated contracts or change orders and a copy of the cost summary submitted to the Owner. The DEQ, the EPA, the Comptroller General of the United States, the United States Department of Labor, and the Owner, or any of their authorized representatives shall have access to all such books, records, documents, and other evidence for the purpose of inspection, audit, and copying during normal business hours. The Contractor will provide proper facilities for such access and inspection.

   b. If this is a fixed price contract awarded through sealed bidding or otherwise on the basis of effective price competition, the Contractor agrees to make paragraphs (a) through (g) of this clause applicable to all negotiated change orders and contract amendments affecting the contract price. In the case of all other types of prime contracts, the Contractor agrees to make paragraphs (a) through (g) applicable to all contract awards in excess of $10,000, at any tier, and to make paragraphs (a) through (g) of this clause applicable to all change orders directly related to project performance.

   c. Audits conducted under this provision shall be in accordance with generally accepted auditing standards and with established procedures and guidelines of the reviewing or audit agency.

   d. The Contractor agrees to disclose all information and reports resulting from access to records under paragraphs (a) and (b) of this clause to any of the agencies referred to in paragraph (a).

   e. Records under paragraphs (a) and (b) above shall be maintained by the Contractor during performance on DEQ assisted work under this contract and for three years after the Owner makes final payment to the Contractor and all other pending matters are closed.

   f. Access to records is not limited to the required retention periods. The authorized representatives designated in paragraph (a) of this clause shall have access to records at any reasonable time for as long as the records are maintained.

g. This right of access clause applies to financial records pertaining to all contracts (except for fixed price contracts awarded through sealed bidding or otherwise on the basis of effective price competition), and all contract change orders regardless of the type of contract, and all contract amendments regardless of the type of contract. In addition, this right of access applies to all records pertaining to all contracts, contract change orders, and contract amendments:

i. To the extent the records pertain directly to contract performance

ii. If there is any indication that fraud, gross abuse, or corrupt practices may be involved; or

iii. If the contract is terminated for default or for convenience.

3. COVENANT AGAINST CONTINGENT FEES: The Contractor assures that no person or selling agency has been employed or retained to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Contractor for the purposes of securing business. For breach or violation of this assurance, the Owner shall have the right to annul the Contract without liability or, at its discretion, to deduct from the Contract price or consideration, or otherwise recover the full amount of such commission, percentage, and brokerage or contingent fee.

4. GRATUITIES

a. If the Owner finds after a notice and hearing that the Contractor or any of the Contractor's agents or representatives offered or gave gratuities (in the form of entertainment, gifts or otherwise) to any official, employee or agent of the Owner, DEQ or EPA in an attempt to secure a contract or favorable treatment in awarding, amending or making any determinations related to the performance of the Contract, the Owner may, by written notice to the Contractor, terminate the Contract. The Owner may also pursue other rights and remedies that the law or this Contract provides.

b. In the event this Contract is terminated as provided in paragraph (a), the Owner may pursue the same remedies against the Contractor as it could pursue in the event of a breach of the Contract by the Contractor, and as a penalty, in addition to any other damages to which it may be entitled by law, be entitled to exemplary damages in an amount which shall be not less than three nor more than ten times the costs the Contractor incurs in providing any such gratuities to any such officer or employee.

5. CONTRACTS FOR PROFESSIONAL SERVICES: The following clause applies only to contracts that include professional services:

a. The Contractor is responsible for the professional quality, technical accuracy, timely completion, and coordination of all designs, drawings, specifications, reports and other services furnished by the Contractor under this Contract. If the Contract involves environmental measurements or data generation, the Contractor shall develop and implement quality assurance practices consisting of policies, procedures, specifications, standards and documentation sufficient to produce data of quality adequate to meet

project objectives and to minimize loss of data due to unforeseen conditions or malfunctions. The Contractor shall, without additional compensation, correct or revise any errors, omissions or other deficiencies in that Contractor's designs, drawings, specifications, reports and other services.

b. The Contractor shall perform the professional services necessary to accomplish the work specified in the Contract in accordance with the Contract and applicable DEQ requirements in effect on the date of execution of the funding assistance agreement for this project.

c. The Owner's or DEQ's approval of drawings, designs, specifications, reports and incidental work or materials furnished shall not in any way relieve the Contractor of responsibility for the technical adequacy of his work. Neither the Owner's nor DEQ's review, approval, acceptance or payment for any of the services shall be construed as a waiver of any rights under the Contract or of any cause for action arising out of the performance of the Contract.

d. The Contractor shall be, and shall remain, liable in accordance with applicable law for all damages to the Owner or DEQ caused by the Contractor's negligent performance of any of the services furnished under this Contract, except for errors, omissions or other deficiencies to the extent attributable to the Owner, Owner-furnished data or third party. The Contractor shall not be responsible for any time delays in the project caused by circumstances beyond the Contractor's control.

e. The Contractor's obligations under this clause are in addition to the Contractor's other express or implied assurances under this Contract or state law and in no way diminish any other rights that the Owner may have against the Contractor for faulty materials, equipment or work.

6. ANTI-LOBBYING ACT: The Contractor agrees to comply with the requirements of the federal Anti-Lobbying Act, Section 1352, Title 31, U.S. Code, which requires disclosure of lobbying activities. The Certification Form, "*Certification of Compliance with Anti-Lobbying Act*", (Attachment A see Section L - Submissions), must be signed by all Contractors entering into contracts of $100,000 or greater.

7. COMPLIANCE WITH COPELAND ACT REQUIREMENTS: The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated in this contract by reference.

8. SUBCONTRACTS: The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

9. CONTRACT TERMINATION - DEBARMENT: A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the Contract, and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.

10. DAVIS-BACON WAGE RATE REQUIREMENTS UNDER THE CONSOLIDATED AND FURTHER CONTINUING APPROPRIATIONS ACT, 2013 (P.L. 113-6): With respect to the Clean Water and Drinking Water State Revolving Funds, Davis Bacon prevailing wage rates are a requirement of the project. All rulings and interpretations of the Davis-Bacon and Related Acts contained in

29 CFR parts 1, 3, and 5 are herein incorporated by referencein the Contract. The following provision shall apply to the Contract:

a. All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

b. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (f) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in section 5.5(a)(4) of the Davis-Bacon Act. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein. Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (c) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

c. The Contractor shall require that any class of laborers or mechanics, including helpers, which is not listed in the general wage determination and which is to be employed under the Contract be classified in conformance with the wage determination. The Contractor and Owner shall submit request for additional classification to DEQ project manager when the following criteria have been met:

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

   ii. The classification is utilized in the area by the construction industry; and

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

   iv. If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Owner agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate),

documentation of the action taken and the request, including the local wage determination shall be sent by the Owner to the DEQ project manager. The DEQ project manager will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor (DOL), Washington, DC. The Contractor and Owner shall transmit such request for additional classification using most recent version of DOL Conformance Request SF1444 Form. The DOL Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the DEQ project manager or will notify the DEQ project manager within the 30-day period that additional time is necessary.

d. In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the Owner do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the DEQ project manager shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the DEQ project manager, to the DOL Administrator for determination. The DOL Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the DEQ project manager within the 30-day period that additional time isnecessary.

e. The wage rate (including fringe benefits where appropriate) determined (c) or (d) of this section, shall be paid to all workers performing work in the classification under this Contract from the first day on which work is performed in the classification.

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

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

h. In the event of Contractor's failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the Contract, the Owner shall withhold or cause to be withheld from the Contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the Contract. DEQ or EPA may, after written notice to the Contractor and Owner, take

such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

i. If a mathematical error, misclassifications, or other error that results in the underpayment of wage or fringe benefits occurs, the Contractor or subcontractor must make wage restitution and submit a corrected certified payroll and a copy of the check showing the underpayment made to the worker, to the Owner.

j. Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractor employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

   i. The Contractor shall submit weekly, for each week in which any Contract work is performed, a copy of all payrolls to the Owner. Such documentation shall be available on request of the DEQ or EPA. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/whd/forms/wh347instr.htm or its successor site. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractor and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Owner for transmission to DEQ or EPA if requested the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a

Contractor to require a subcontractor to provide addresses and social security numbers to the Contractor for its own records, without weekly submission to the Owner.

ii. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

1. That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

2. That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

3. That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the Contract.

iii. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by this section.

iv. The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

v. The Contractor or subcontractor shall make the records of this section available for inspection, copying, or transcription by authorized representatives of the DEQ, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or DEQ may, after written notice to the Contractor and Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

k. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has

been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or sub contractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the DOL Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

l. Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training

Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

m. Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10), and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

n. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the Contract, and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.

o. Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and Owner, DEQ, EPA, the U.S. Department of Labor, or the employees or their representatives.

p. Certification of eligibility.

   i. By entering into this Contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

   ii. No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

   iii. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

q. Contract Work Hours and Safety Standards Act: For Contract in excess of $100,000.00, the Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics shall not require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

i. In the event of any violation set forth in this section the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in this section.

ii. The Owner shall withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under the Contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (i) of this section.

iii. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in this section.

iv. If the Contract is subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, socialsecurity number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Records to be maintained under this paragraph shall be made available by the Contractor or subcontractor for inspection, copying, or transcription by authorized representatives of DEQ and the Department of Labor, and the Contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

11. BUILD AMERICA, BUY AMERICA: The goods and services under this Contract are being funded with federal monies and have statutory requirements commonly known as “Build America, Buy America” that requires all of the iron and steel, manufactured products, and construction materials used in the project to be produced in the United States (“Build America, Buy America Requirements”) including iron and steel, manufactured products, and construction materials provided by the Contactor pursuant to this Contract.

a. Notwithstanding any other provision of this Contract, any failure to comply with this paragraph by the Contractor shall permit the Owner or DEQ to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Owner or DEQ resulting from any such failure (including without limitation

any impairment or loss of funding, whether in whole or in part, from DEQ or any damages owed to DEQ by the Owner). DEQ is a third-party beneficiary and neither this paragraph (nor any other provision of this Contract necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of DEQ.

b. The Contractor shall secure a manufacture's certification of compliance statement with Build America, Buy America Requirements for all iron and steel, manufactured products, and construction materials delivered to the project site. The certification of compliance statement shall include, at a minimum 1) Project name and location 2) Product delivered to the project site 3) Documentation includes statement attesting that the products supplied to the Owner are compliant with Build America, Buy America Requirements (reference the Infrastructure Investment and Jobs Act ("IIJA") or the Bipartisan Infrastructure Law (BIL) are also acceptable. References to the American Iron and Steel (AIS) requirements are also acceptable and reciprocal with for such items. 4) Documentation that manufacturing occurred in the United States, which may include, the location(s) of manufacturing for each manufacturing step that is being certified. It is acceptable for manufactured products to note a single point of manufacturing, documenting that the final point of manufacturing is in the United States. 5) Signature of company representative on company letterhead. The signatory of the certifying statement shall affirm their knowledge of the manufacturing processes for the referenced product(s) and attests that the product meets the Build America, Buy America Requirements.

c. The Contractor shall develop and maintain an on-site product compliance log containing current records of all iron and steel, manufactured products, and construction materials arriving on the construction site. The compliance log shall include the manufacture's certification of compliance statement, type of product (e.g. iron and steel, manufactured products, or construction materials), purchase order number and sufficient product information to enable tracking of the products, such as product description, serial and lot numbers (if available), manufacturer's name, and origin of shipment including city and state. In addition, a separate log shall be maintained to track information related to de minimis materials such as purchase order number, product description, current value of de minimis materials, and the running percentage of de minimis product value received to the total cost of the project. The on-site materials compliance log and de minimis log shall be made available to the Owner and DEQ upon request.

d. Contractor shall submit an executed Bidder's Certification of Compliance, (Form BABA-1, see Section L – Submissions), covering all proposed steel and iron products, manufactured products, and construction materials shall be furnished by bidders as part of the sealed bid; this Certification is required in order to constitute a valid bid.

12. REQUIRED NONDISCRIMINATION CONTRACT REQUIRMENT: The Contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the Contractor to carry out these requirements is a material breach of this Contract which may result in the termination of this Contract or other legally available remedies.

13. REQUIRED CERTIFICATIONS:

Boycott of Israel. Pursuant to Idaho Code section 67-2346, if payments under the Contract exceed one hundred thousand dollars ($100,000) and Contractor employs ten (10) or more persons, Contractor certifies that it is not currently engaged in, and will not for the duration of the Contract engage in, a boycott of goods or services from Israel or territories under its control. The terms in this section defined in Idaho Code section 67-2346 shall have the meaning defined therein.

Ownership or Operation by China. Pursuant to Idaho Code section 67-2359, Contractor certifies that it is not currently owned or operated by the government of China and will not for the duration of the Contract be owned or operated by the government of China. The terms in this section defined in Idaho Code section 67-2359 shall have the meaning defined therein.

Boycott of Various Industries. Pursuant to Idaho Code § 67-2347A, if payments under the contract exceed one hundred thousand dollars ($100,000) and Contractor employs ten or more persons, Contractor is not currently engaged in, and will not for the duration of the contract engage in, a boycott of any individual or company because the individual or company: (a) engages in or supports the exploration, production, utilization, transportation, sale or manufacture of fossil fuel based energy, timber, minerals, hydroelectric power, nuclear energy, or agriculture; or (b) engages in or supports the manufacture, distribution, sale, or use of firearms. The terms in this Section defined in Idaho Code § 67-2347A shall have the meaning defined therein, including through reference to another section of Idaho code.

H. SUSPENDED AND DEBARRED: The Contractor shall comply with Subpart C of 2 CFR Part 180 and 2 CFR Part 1532 (Suspension and Debarment). The Contractor or subcontractor shall not knowingly enter into covered transactions (any contract awarded to a subcontractor, supplier, or consultant where the expected amount of the contract is $25,000 or greater) with excluded persons.

1. General: Prohibition on Equipment Purchase from Excluded Contractors: In addition, Owner and Contractors shall check that certain prohibited equipment, systems, or services, including equipment, systems, or services are not produced or provided by entities identified and recorded in the System for Award Management Items included in the prohibition are not eligible SRF costs, and the SRF programs cannot reimburse Owner or Contractors for these costs.
2. Telecommunications and Surveillance Equipment: Owner and Contractors are prohibited from obligating or expending loan funds to procure equipment, services, or systems that use telecommunications equipment or services produced by Huawei Technologies Company or ZTE Corporation. Owner and Contractors also may not use SRF funds to purchase: video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company. Owner and Contractors shall be mindful of automatic meter reading (AMR) technology and advanced metering infrastructure (AMI), instrumentation control systems (e.g. process control systems, distributed control systems and programmable logic controls),

and security cameras and other electronic security measures to ensure that those items are procured from a non-excluded entity.

3. Condition For all Lower Tier Transactions: The Contractor or subcontractor shall insert this condition into all lower tier covered transactions and ensure any subsequent lower tier covered transactions include this condition. Excluded parties may be verified at www.sam.gov.

I. BIDDER'S LIST OF SUBCONTRACTORS: The Contractor shall submit Form 1. Bidder's List of Subcontractors (see Section L - Submissions) to the Owner who shall provide a copy to DEQ. The list shall provide specific contact information on the Contractor and all subcontractors including business name, contact, address, phone, email, date bid submitted; and shall outline the items of work for which they will be retained; and shall indicate if they are a Disadvantaged Business Enterprise (DBE). The completed form must be submitted prior to DEQ issuance of the Authorization to Award.

J. EQUAL EMPLOYMENT OPPORTUNITY/AFFIRMATIVE ACTION (EEO/AA): The EEO/AA requirements only apply to Contractor who has (1) 50 or more employees and (2) signs a contract, subcontract, or purchase order amounting to $50,000 or more.

1. Online Standard Form 100 (EEO-1): The Contractor shall complete and submit the online form 100 to the Joint Reporting Committee within 30 days after the award of such a contract or purchase order, unless such person has submitted such a report within 12 months preceding the date of award. Subsequent reports shall be submitted annually on or before the 30th day of September. Failure to file timely, complete, and accurate reports as required constitutes non-compliance with Contractors' or subcontractors' obligations under Executive Order 11246, as amended, and is grounds for the imposition of sanctions authorized by Executive Order 11246 and other rules and regulations issued pursuant thereto. Further information is available at: https://egov.eeoc.gov/eeo1/.

2. The EEO Poster (EEOC-P/E-1): The Contractor must post the EEO poster on project site; the EEO poster may be ordered through the Equal Employment Opportunity Commission (EEOC) Website at: http://www1.eeoc.gov/employers/poster.cfm.

3. Contact the EEOC: The Contractor shall contact the EEOC within 30 days of Contract award. EEO Contact Information: EEO-1 Joint Reporting Committee P.O. Box 19100, Wash. D.C. 20036-9100; phone (866) 286-6440; Email: e1.techassistance@eeoc.gov.

K. DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION: In compliance with the President's Policy Statement on Disadvantaged Business Enterprises (DBEs), Executive Order 12432, and the Environmental Protection Agency's Procurement Under Assistance Agreements Regulation (40 CFR 33), all bidders shall be required to comply fully with these specifications toward the goal of equitable utilization of DBEs. DBEs consist of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Small Business Enterprises (SBE). Such utilization may be through prime contracting, subcontracting, joint ventures, procurement of supplies, material or equipment, or other business participation utilized in performing this project. Contractors shall take necessary and reasonable steps to ensure DBEs have the maximum opportunity to compete

for and perform contracts. Contractors shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of EPA-assisted projects.

1. **Requirements:**

a) Bidders must take the following "Good Faith Efforts" in awarding subcontracts for supplies, construction, services, and equipment:
b) Make DBEs aware of contracting opportunities through outreach and recruitment activities.
c) Provide information on forthcoming opportunities and establish reasonable timeframes that encourage participation.
d) Consider whether firms competing for large contracts could subcontract with DBEs.
e) Encourage contracting with a consortium of DBEs when a contract is too large for one firm.
f) Use services and assistance from the Idaho Transportation Department, Idaho Department of Environmental Quality's Fiscal Office, the Small Business Administration, and the Office of Minority Business Enterprise of the U.S. Department of Commerce.

2. **Recordkeeping:**

The Contractor must maintain all records documenting its compliance with the **Six Good Faith Efforts** under 40 CFR Part 33 Subpart C. These records should be retained in accordance with applicable record retention requirements of this specification.

L. SUBMISSIONS (Copies of Required Forms Follow this Section)

1. Form to be submitted by all bidders as part of the sealed bid:
    a. FORM BABA-1: Bidder's Certification of Compliance With Build America, Buy America (BABA) Provisions
2. Forms to be submitted by the Successful Bidder prior to issuance of the authorization to award:
    a. Form 1: Bidder's List of Subcontractors
3. Forms to be submitted by the Successful Bidder to the Owner prior to issuance of the notice to proceed:
    a. ATTACHMENT A Certification of Compliance with Anti-Lobbying Act (Anti- Lobbying Certification)
    b. ATTACHMENT B Contractor's Compliance Statement (Executive Order #11246)
    c. ATTACHMENT C Certification of Non-Segregated Facilities

To be submitted as part of the sealed bid; Owner forwards a copy to DEQ

FORM BABA-1
BIDDER'S CERTIFICATION OF COMPLIANCE WITH THE CURRENT SRF ASSISTANCE BUILD AMERICA, BUY AMERICA (BABA) PROVISIONS

(To be submitted as part of the sealed bid)

Bidder's Statement of Certification

The Bidder acknowledges to and for the benefit of the ("Owner") for the ("Project") that the Bidder understands the project is being funded in part with SRF Assistance. Build America, Buy America ("BABA") requirements specify that all iron and steel, manufactured products, and construction materials used in the project shall be produced in the United States. Consistent with the terms of the Owner's bid solicitation and the provisionsof SRF Assistance, the Bidder hereby represents and warrants to and for the benefit of the Owner and DEQ that:

1. The Bidder has reviewed and understands the BABA requirements,
2. The Bidder certifies all of the iron and steel, manufactured products, and construction materials used in the project will be and/or have been produced in the United States in a manner that complies with the BABA requirements, unless a waiver of the requirements is approved by Owner and DEQ.
3. The Bidder agrees to provide any further verified information, certification or assurance of compliance with BABA requirements, or information necessary to support a waiver of the BABA, as may be requested by the Owner or DEQ.

Bidder Signature: _____ Date: _____

Title: _____

Organization: _____

To be Submitted Prior to authorization to Award; Owner forwards a copy to DEQ

FORM 1. BIDDER'S LIST		Items of Work Bid On	Date Bid Submitted	MBE/WBE Contractor
Prime Contractor Information				
Business Name:				
Contact Name:				
Mailing Address:				
Phone:				
Email:				
Subcontractor Information				
Business Name:				
Contact Name:				
Mailing Address:				
Phone:				
Email:				
Subcontractor Information				
Business Name:				
Contact Name:				
Mailing Address:				
Phone:				
Email:				
Subcontractor Information				
Business Name:				
Contact Name:				
Mailing Address:				
Phone:				
Email:				

COPY THIS PAGE IF ADDITIONAL SUBCONTRACTORS ARE NEEDED

Owner receives from the Successful Bidder prior to issuing Notice to Proceed

ATTACHMENT A
CERTIFICATION OF COMPLIANCE WITH ANTI-LOBBYING ACT

The undersigned certifies, to the best of his/her knowledge and belief that:

1. No federally appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federally funded grant, the making of any federally funded loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federally funded contract, grant, loan or cooperative agreement.

2. If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federally funded contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

_____ _____

Signature Date

Owner Receives from the Successful Bidder Prior to issuing Notice to Proceed

ATTACHMENT B
CONTRACTORS COMPLIANCE STATEMENT
(EXECUTIVE ORDER #11246)

Date: _____

This statement relates to a proposed contract with (name of grantee):

who expects to finance the contract with assistance from the Environmental Protection Agency. I am the undersigned bidder or prospective Contractor. I represent that:

I have ☐ I have not ☐ participated in a previous contract or subcontract subject to Executive Order 11246 of September 24, 1965 (regarding equal employment opportunity) or a preceding similar Executive Order. I agree to comply with all the provisions of this Executive Order and the rules, regulations and relevant orders of the Secretary of Labor. (60-1.4(b)(4)).

Signature: _____ Date: _____

Name and Title of Signer: _____

Owner Receives from the Successful Bidder Prior to issuing Notice to Proceed

ATTACHMENT C
CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to federally assisted construction contracts and related subcontracts exceeding $10,000 which are not exempt from the Equal Opportunity clause.)

The federally assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor certified, further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work area, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or area, in fact, segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed contractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such, certification in this file.

Signature: _____ Date: _____

Name and Title of Signer: _____

DIVISION 1

GENERAL REQUIREMENTS

SUNRISE
ENGINEERING

INDEX OF SUBSECTIONS

00700.1 DEFINITIONS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated which shall apply to both the singular and plural thereof:

ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement or Bid which modify or interpret the Contract Documents, Drawings, and Specifications, by additions, deletions, clarifications, or corrections.

AGREEMENT OR CONSTRUCTION CONTRACT AGREEMENT - The written contract between the Owner and the Contractor covering the work to be performed; other Contract Documents are attached to the Agreement and made part thereof as provided therein.

BID - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

BIDDER - Any person, firm, or corporation submitting a bid for the Work.

BONDS - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the Contractor and its surety in accordance with the Contract Documents.

CHANGE ORDER - A written order to the Contractor authorizing an addition, deletion, or revision in the Work within the general scope of the Contract Documents or authorizing an adjustment in the Contract Price or Contract Time.

CONTRACT DOCUMENTS - The contract, including Advertisement for Bids (or notice to Contractors of Intention to Receive Bids), Instructions to Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Specifications, Supplemental Instructions, Special Provisions and Addenda.

CONTRACT PRICE - The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

CONTRACT TIME - The number of calendar days stated in the Contract Documents for the completion of the Work.

CONTRACTOR - The person, firm, or corporation with whom the Owner has executed the Agreement.

DRAWINGS - The part of the Contract Documents which show the characteristics and scope of the Work to be performed and which have been prepared or approved by the Engineer.

ENGINEER - Sunrise Engineering

FIELD ORDER - A written order effecting a change in the Work not involving a material adjustment in the Contract Price or an extension of the Contract Time, issued by the Engineer to the Contractor during construction.

NOTICE OF AWARD - The written notice of acceptance of a bid, from the Owner to the successful Bidder, which also sets the time in which the Contract must be signed.

NOTICE TO PROCEED - Written communication issued by the Owner to the Contractor authorizing the Contractor to proceed with the Work and establishing the date of commencement and completion of the Work.

OWNER - A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the Work is to be performed.

PROJECT – Synonymous with The Work, i.e., the total construction to be provided under the Contract Documents which may be the whole or a part as indicated elsewhere in the Contract Documents.

RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the Owner who is assigned to the Project site or any part thereof.

SAMPLES - Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work, and which establish the standards by which such portion of the Work will be judged.

SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by the Contractor, subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

SPECIAL PROVISIONS - A part of the Contract Documents, Additions and modifications to the Standard Specifications specifically prepared for the contract.

SPECIFICATIONS - A part of the Contract Documents consisting of written descriptions of the technical nature of materials, equipment, construction systems, standards, and workmanship.

SUBCONTRACTOR - An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the Work at the site.

SUBSTANTIAL COMPLETION - That date as certified by the Engineer when the construction of the Work or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Work or specified part can be utilized for the purposes for which it is intended.

SUPPLEMENTAL GENERAL CONDITIONS - The part of the Contract Documents which amends or supplements these General Conditions.

SUPPLIER—Any person or organization that supplies materials or equipment for the Work, including that fabricated to a special design, but does not perform labor at the site.

WORK – Labor or work necessary to produce the construction required by the Contract Documents and all materials and equipment incorporated or to be incorporated in the project.

WRITTEN NOTICE - Any communications to any party of the Agreement relative to any part of the Agreement prepared in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at its last given address or delivered in person to said party or their authorized representative on the Work.

00700.2 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

As necessary to carry out the Work required by the Contract Documents, the Engineer may furnish additional instructions and detail drawings to the Contractor. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

00700.3 SCHEDULES, REPORTS, AND RECORDS

00700.3.1 SUBMITTALS

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data where applicable as are required by the Contract Documents for the Work to be performed.

00700.3.2 CONSTRUCTION PROGRESS SCHEDULE

At the Pre-Construction Conference, the Contractor shall submit a construction progress schedule showing the order in which it proposes to carry on the Work, including dates at which they will start the various parts of the Work, estimated date of completion of each part and, as applicable:

- The dates at which special detail drawings will be required; and
- Respective dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies, and equipment.

00700.3.3 SCHEDULE OF PAYMENTS

The Contractor shall also submit a schedule of payments that it anticipates will be earned during the course of the Work.

00700.4 DRAWINGS AND SPECIFICATIONS

00700.4.1 INTENDED PURPOSE

The intended purpose of the Drawings and Specifications is to furnish the Contractor with sufficient information and direction so that he can furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the Work in accordance with the Contract Documents and to complete the Work in an acceptable manner, ready for use, occupancy or operation by the Owner.

00700.4.2 GOVERNANCE

In case of conflict between the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings.

00700.4.3 DISCREPANCIES

Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after its discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the Contractor's risk.

00700.5 SHOP DRAWINGS

00700.5.1 SUBMITTAL

The Contractor shall provide Shop Drawings as may be necessary for the execution of the Work as required by the Contract Documents. Portions of the Work requiring a Shop Drawing or sample submission shall not begin until the Contractor has received a reviewed copy of the Shop Drawing or submission and has addressed any Engineer comments. When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that the Contractor has reviewed, checked, and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents.

00700.5.2 REVIEW

The Engineer shall promptly review all Shop Drawings. The Engineer's review of any Shop Drawings shall not release the Contractor from responsibility for deviations from the Contract Documents. Acceptability of any Shop Drawing which substantially deviates from the requirement of the Contract Documents shall be evidenced by a Change Order. A copy of each reviewed Shop Drawing and each reviewed sample shall be kept in good order by the Contractor and accessible at the site and shall be available to the Engineer.

00700.6 MATERIALS, SERVICES AND FACILITIES

00700.6.1 PURCHASING OF MATERIALS AND SUPPLIES

It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time. Materials, supplies, or equipment to be incorporated into the Work shall not be purchased by the Contractor or any subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller or any third-party financing entity.

00700.6.2 STORAGE OF MATERIALS AND EQUIPMENT

Materials and equipment shall be stored so as to ensure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located to facilitate prompt inspection. The Contractor shall solely be responsible for making arrangements for suitable off-site storage of materials or equipment needed to accomplish the Work.

00700.6.3 FURNISHING AND INSTALLATION

Materials, supplies, and equipment shall be in accordance with samples submitted by the Contractor and reviewed by the Engineer. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.

00700.7 INSPECTION AND TESTING

Inspection and testing of the Work shall meet the following requirements:

- All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.
- The Owner shall provide all inspection and testing services not required by the Contract Documents.
- The Contractor shall provide at its expense any testing and inspection services required by the Contract Documents.
- If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing, or approval.
- Inspections, tests, or approvals by the Engineer or others shall not relieve the Contractor from its obligations to perform the Work in accordance with the requirements of the Contract Documents.
- The Engineer and the Engineer’s representatives will at all times have access to the Work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.
- If any work is backfilled or covered contrary to the written instructions of the Engineer it must, if requested by the Engineer, be uncovered for its observation and replaced at the Contractor's expense.
- If the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction. If such work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

00700.8 SUBSTITUTION OF MATERIALS

Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue number, it shall be understood that the reference is made for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function may be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor.

Any cost reduction shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time. The Owner's parts inventory controls or standards may preclude substitution.

00700.9 PATENTS

The Contractor shall pay all applicable royalties and license fees. They shall defend all suits or claims for infringement of any patent rights and hold the Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is exclusively specified. If the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, the Contractor shall be responsible for such loss.

00700.10 SURVEYS, PERMITS, AND REGULATIONS

00700.10.1 SURVEYS

The Owner shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the Work together with a suitable number of benchmarks adjacent to the Work as shown in the Contract Documents. From the information provided by the Owner, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pipe locations and other working points, lines elevations, and cut sheets from information provided by the Engineer.

00700.10.2 BENCHMARKS

The Contractor shall carefully preserve benchmarks, property corners, reference points and stakes. If willful or careless destruction to these stakes, marks or reference points results from the activities of the Contractor, the Contractor shall be charged with the resulting expense for their restoration and for any mistakes that may be caused by their loss or disturbance.

00700.10.3 TEMPORARY PERMITS AND LICENSES

Permits and licenses of a temporary nature necessary for the execution of the Work shall be secured and paid for by the Contractor, unless otherwise stated. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, it shall promptly notify the Engineer in writing, and any necessary changes shall be made as provided in Subsection 00700.13, Changes in the Work.

00700.11 PROTECTION OF WORK, PROPERTY, AND PERSONS

00700.11.1 SAFETY PRECAUTIONS

The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work and shall comply with all OSHA, State and local requirements. This shall include taking all necessary precautions for the safety of, and providing the necessary protection to prevent damage, injury or loss to:

- All employees on the Work and other persons who may be affected thereby,
- All the work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and
- Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall be solely responsible for the safety, efficiency, and adequacy of its equipment, materials and methods; and for any damage which may result from their failure or improper operation and maintenance.

00700.11.2 LEGAL COMPLIANCE

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The Contractor will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. The Contractor will notify owners of adjacent utilities when execution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or part, by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

00700.11.3 EMERGENCIES

In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss. The Contractor will give the Engineer prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

00700.11.4 LIMITED USE OF WORKSITE

Unless otherwise allowed by these Contract Documents, the Contractor’s use of the Work site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities and field offices.

00700.12 SUPERVISION BY CONTRACTOR

00700.12.1 SUPERVISORY RESPONSIBILITIES

The Contractor will supervise and direct the Work and will be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor will employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work.

00700.12.2 ACCESS TO ROADS, STREETS, UTILITIES, ETC.

The Contractor shall make its own investigation of the condition of available public roads and their clearances, restrictions and limitations which affect access to the Work and shall further be responsible for construction and maintenance of any haul road required for accomplishment of the Work. Nothing herein shall be construed to entitle the Contractor to exclusive use of any public street, alleyway, or parking area during the performance of the Work. The Contractor shall not close any public street or roadway without obtaining permission from both the Engineer and the appropriate jurisdictional authority.

The Contractor shall conduct operations so as to not interfere with the authorized work of utility companies or other entities so authorized within these areas. When excavation is performed along a public street or roadway, access to fire hydrants, appropriate erosion protection measures and passage of traffic in at least one lane shall be provided at all times by the Contractor.

00700.13 CHANGES IN THE WORK

00700.13.1 CHANGE IN SCOPE OF WORK

The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or affect the time required for performance of the Work, an equitable adjustment shall be authorized by Change Order.

00700.13.2 CHANGE ORDER

A Change Order will be issued to decrease or increase actual quantities used which are different than those shown in the Bid Schedule. All changes must be fully approved in writing on a Change Order before they can be included in a payment to the Contractor. The Contract Change Order form will be used to document and authorize changes to the Contract Documents unless approval to use another form is obtained from the Engineer.

00700.13.3 FIELD ORDER

The Engineer may, at any time, issue a Field Order to interpret construction plans or to document communications with the Contractor concerning details of the Work. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer.

If the Contractor believes that such Field Order entitles it to a change in Contract Price and/or time, it shall give the Engineer written notice thereof within seven (7) days after the receipt of the Field Order. The Contractor then shall document and submit the basis for the change in Contract Price or time within thirty (30) days.

If the Owner does not accept that a Change Order is appropriate as outlined in 13.1 and 13.2 above, written notice of this decision shall be provided to the Contractor within 30 days of the receipt of the Contractor's documentation of the change in the Contract price or time. Any dispute shall thereafter be resolved pursuant to the terms of these Contract Documents. Regardless of any dispute by and between the Contractor, Engineer and Owner, Contractor shall perform all work required by the Field Order, Change Order or other contract document contained herein.

00700.14 CHANGES AFFECTING CONTRACT PRICE

00700.14.1 CHANGE ORDER

The Contract Price may be changed only by a Change Order. The value of any work covered by a Change Order or of any claim for increase or decrease in the Contract Price shall be determined by one or more of the following methods in the order of precedence listed below:

- Unit prices previously approved in the Contract Documents.
- An agreed lump sum price.
- The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the Work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the Work to cover the cost of general overhead and profit.

00700.14.2 CHANGE IN QUANTITIES

The Owner reserves the right to change quantities listed in the Bid Schedule in order to revise the total Contract Price to match funding available in the Owner's budget.

00700.15 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

00700.15.1 TIME FOR COMPLETION

The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice to Proceed. The Contractor will proceed with the Work at such rate of progress as to ensure full completion within the Contract Time.

Both the Contractor and the Owner expressly understand and agree, separately and jointly, that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality at the time of the Work.

0700.15.2 LIQUIDATED DAMAGES

If the Contractor shall fail to complete the Work within the Contract Time, or within any extension of time granted by the Owner, then the Contractor will pay liquidated damages to the Owner in the amount specified in the Contract for each calendar day that the Contractor is in default as stipulated in the Contract Documents.

The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due to the following, and the Contractor has promptly given written notice of such delay to the Owner and Engineer:

- To any preference, priority or allocation order duly issued by the Owner, or
- To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; or
- To any delays of the subcontractor occasioned by any of the causes specified in the foregoing two paragraphs.

00700.16 CORRECTION OF WORK

The Contractor shall promptly remove from the premises all work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not. The Contractor shall promptly replace and re-execute that work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement. If the Contractor does not take action to remove such rejected work within ten (10) days after receipt of written notice, the Owner may remove such work and store the materials at the expense of the Contractor. All removal and replacement work shall be done at the Contractor's expense.

00700.17 SUBSURFACE CONDITIONS

00700.17.1 DISCOVERY OF CONDITIONS

If, during the progress of the Work, previously known or unknown subsurface or latent physical conditions are encountered at the site which

- Differ materially from those indicated in the Contract Documents, or
- Differ materially from those ordinarily encountered and generally recognized as inherent in the Work provided for in the Contract Documents,

The party discovering such conditions shall promptly notify the other party both verbally and in writing of the specifically differing conditions before the site is further disturbed and before the affected work is performed.

00700.17.2 OWNER INVESTIGATION

The Owner shall promptly investigate the conditions, and if found that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Contract Documents shall be modified by a Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless the required written notice has been given; provided that the Owner may, if it determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

00700.18 SUSPENSION OF WORK AND TERMINATION OF CONTRACT

00700.18.1 SUSPENSION OF WORK BY OWNER

At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to the Contractor and the Engineer. The notification will fix the date on which work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be allowed an adjustment in the Contract Price or an extension of the Contract Time, or both, directly attributable to any such suspension if Contractor makes a claim therefor as provided in Subsection 00700.30.

00700.18.2 TERMINATION OF CONTRACT FOR CAUSE BY OWNER

00700.18.2.1 GROUNDS FOR TERMINATION - The Owner may terminate the contract for cause as a result of the occurrence of any one or more of the following circumstances:

- Contractor's persistent failure to perform the Work in accordance with the Contract Documents including, but not limited to, failure to supply sufficiently skilled workers or suitable materials or equipment or failure to adhere to the progress and payment schedule established under Subsection 00700.3.3.
- Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
- Contractor's disregard of the authority of Engineer; or
- Contractor's violation in any substantial way of any provisions of the Contract Documents.

00700.18.2.2 ASSUMPTION OF WORKSITE BY OWNER - If one or more of the events described in the foregoing list occur, Owner may, after giving Contractor (and the surety, if any) seven days written notice, terminate the services of Contractor, exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment and machinery at the Site and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and finish the Work as Owner may deem expedient.

00700.18.2.3 NO FURTHER PAYMENT TO CONTRACTOR - In such case, Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses and damages (including, but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. The Engineer shall review such claims, costs, losses, and damages incurred by Owner for reasonableness and, when approved by the Engineer, they shall be incorporated into the Contract as a Change Order. When exercising any rights or remedies under this paragraph Owner shall not be required to obtain the lowest price for the work performed.

00700.18.2.4 FURTHER RECOURSE AGAINST CONTRACTOR - Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of monies due to Contractor by Owner will not release Contractor from liability.

00700.18.3 TERMINATION OF CONTRACT FOR CONVENIENCE

The Owner, for his/her convenience, and without cause and without prejudice to any other right or remedy of Owner, may terminate the Contract by giving seven days written notice to Contractor and to Engineer. In such case, Contractor shall be paid (without duplication of any item) as follows:

- For completed and acceptable work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such work;
- For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted work, plus fair and reasonable sums for overhead and profit on such expenses;
- For all claims, costs, losses and damages (including, but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or

arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

- For reasonable expenses directly attributable to termination.

The Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

00700.18.4 TERMINATION OF CONTRACT BY CONTRACTOR

If, through no act or fault of Contractor, the Work is suspended:

- For more than 90 consecutive days by Owner, or
- Because of an order of a court or other public authority, or
- The Engineer fails to act on any Application for Payment within 30 days after it is submitted, or
- Owner fails for 30 days to pay Contractor any sum finally determined to be due, then

Contractor may, upon seven days written notice to Owner and to Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Subsection 00700.18.3.

00700.19 PAYMENTS TO THE CONTRACTOR

00700.19.1 APPLICATION FOR PAYMENT

00700.19.1.1 SUBMISSION OF APPLICATION - On or before the 10th day of each month, or as otherwise agreed, the Contractor will submit to the Engineer an Application for Payment for the work done in the previous month. The application shall be filled out and signed by the Contractor and be supported by such data as the Engineer may reasonably require.

The Application for Payment may include an allowance for the cost of major materials and equipment which have been delivered and suitably stored at or near the Work site but have not yet been incorporated into the Work. If payment is requested on this basis, the Application for Payment shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the Owner's title to the material and equipment and protect its interest therein, including proof of full coverage under applicable insurance. See Subsection 00700.21.4.5 below.

00700.19.1.2 ENGINEER'S APPROVAL - The Engineer will, within seven (7) days following receipt of each Application for Payment, review and either approve or reject the application. The Engineer will indicate approval in writing and present the request for payment to the Owner or trustee as applicable. If the application is rejected, the Engineer will return the application to the Contractor indicating in writing the reasons for rejecting it. In the latter case, the Contractor may make necessary corrections or revisions and resubmit the Application for Payment.

00700.19.1.3 PAYMENT BY OWNER - The Owner or trustee will, within thirty (30) days of presentation of an approved Application for Payment, pay the Contractor a progress payment on the basis of the Application. The Owner shall deduct, retain, and administer the retainage amounts of each payment in accordance with provisions of applicable state and local laws. Unless otherwise specified in the Construction Contract Agreement or in the Special Provisions, amounts deducted, retained, administered, and paid shall be as described below:

- As directed by the Engineer, the Owner shall deduct and retain up to ten (10) percent of the amount of each payment until there has been ninety-five (95) percent completion and acceptance of all work covered by the Contract Documents.
- When not less than ninety-five (95) percent of the Work has been completed, the Engineer may reduce the amount of retainage to one and one-half percent of the original Contract Price to ensure completion.
- Upon completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, less authorized deductions.

00700.19.2 NON-PAYMENT BY OWNER

Unless otherwise specified in the Agreement or elsewhere in the Contract Documents, if the Owner fails to make payment thirty (30) days after approval by the Engineer, in addition to other remedies available to the Contractor, there shall be added to each such payment interest at the current prime rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.

00700.19.3 WITHOLDING OF PAYMENT BY OWNER

00700.19.3.1 DEFICIENCIES IN THE WORK - As a result of subsequently discovered evidence, the Owner may, after consultation with the Engineer, withhold or nullify the whole or part of any payment application as may be necessary to protect the Owner from loss for:

- Defective work not remedied
- Claims filed
- Failure of the Contractor to make payments properly to subcontractors or suppliers.
- Damage to another Contractor
- Performance of the Work in violation of the terms of the Contract Documents.

In the event this situation arises where the Work is substantially complete but lacks testing, cleanup and/or corrections, quantities may be reduced proportionately in the payment to cover such testing, cleanup and/or corrections.

When the deficiencies of the contract terms contributing to this action are corrected, payment will be made for amounts due in full.

00700.19.3.2 CONTINUED NON-PERFORMANCE - In the instance of continued non-performance or non-compliance on the part of the Contractor in making remedies or corrections to deficiencies in the Work, the Owner may himself, or with the help of another contractor or hired worker, perform the work necessary to bring about the required corrections and/or remedies. The cost of such work, to include both labor and materials, will be withheld from payments otherwise due to the Contractor until the situation has been resolved.

00700.19.3.3 REFERENCE - See also Subsection 00700.19.4 next below.

00700.19.4 PAYMENT INDEMNIFICATION

00700.19.4.1 SATISFACTION OF OBLIGATIONS - The Contractor will indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the Work.

The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so, the Owner may, after having notified the Contractor, pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose upon the Owner any obligations to either the Contractor, the Contractor's surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the Contract Documents by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

00700.19.4.2 REFERENCE - See also Subsection 00700.24 below.

00700.19.5 FINAL PAYMENT ON COMPLETION OF WORK

Upon completion and acceptance of the Work, the Engineer shall issue a certificate, attached to the final Application for Payment, that the Work has been accepted under the conditions of the Contract Documents. The entire balance found to be due the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the Owner, shall be paid to the Contractor within sixty (60) days (or per state law) of completion and acceptance of the Work.

00700.19.6 ACCESS TO PREMISES AND FACILITIES

00700.19.6.1 USE OF COMPLETED WORK – At any time, the Owner may, with the approval of the Engineer and with the concurrence of the Contractor, use any completed or substantially completed portions of the Work. Such use shall be authorized by issuance of a Notice of Substantial Completion and shall not constitute an acceptance of such portions of the Work.

00700.19.6.2 NON-CONTRACT WORK - The Owner shall have the right to enter the premises for the purpose of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged work except such as may be caused by agents or employees of the Owner.

00700.20 ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the Owner and others relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or its sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bond.

00700.21 INSURANCE

00700.21.1 PURCHASE OF INSURANCE

The Contractor shall purchase insurance to protect against liability, loss, or other expense arising from damage to property or injury to or death of any person or persons incurred in any way out of, in connection with, or resulting from the Work provided hereunder. The Contractor shall purchase the insurance from reliable insurance companies authorized to do business in the state in which the Work is to be performed. The insurance shall be rated "A" or better and have a financial size category of Class VII or larger as determined by A.M. Best Company at the time the Contract Documents are executed.

00700.21.2 CERTIFICATE OF INSURANCE.

Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. Such Certificates shall identify the Owner and Engineer (and any other party identified in the Supplemental General Conditions) as additional insured. These Certificates shall contain a provision that coverage afforded under the policies will not be materially changed or reduced unless at least thirty (30) days prior written notice has been given to the Owner.

00700.21.3 COVERAGE OF INSURANCE

Insurance purchased by the Contractor shall provide protection against claims including, but not limited to, those set forth below, which may arise out of, or result from, the Contractor's execution of the Work, whether such execution be by the Contractor or by any subcontractor or by any other person directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- Claims under workmen's compensation, disability benefit and other similar employee benefit acts;
- Claims for damages because of bodily injury, occupational sickness or disease, or death of its employees;
- Claims for damages because of bodily injury, sickness or disease or death of any person other than its employees;
- Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and
- Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

00700.21.4 REQUIRED INSURANCE

The required insurance shall be the following or equivalent, where each applies:

00700.21.4.1 WORKERS COMPENSATION - Workers Compensation Insurance and Employer's Liability Insurance that provide statutory benefits. The Best's rating requirements are waived for coverage provided by the Worker's Compensation Fund within the state in which the Project is located. The Contractor shall require all subcontractors at any tier to take and maintain similar policies of Workers' Compensation Insurance.

00700.21.4.2 COMPREHENSIVE - Comprehensive General Liability Insurance and/or Commercial General Liability Insurance, including coverage for premises and operations, explosion, collapse, and underground hazards, contractual (including this contract, and personal injury including employees) with limits of not less than $1,000,000 combined single limit per occurrence, and not less than $2,000,000 aggregate which shall be designated as applying to this contract. If this insurance is made on a "claims made" basis, the certificate of insurance required above shall indicate, and the policy shall contain, an extended reporting period provision or similar "tail" provision such that claims reported up to one (1) year beyond the date of completion of this contract are covered.

00700.21.4.3 AUTOMOBILE - Comprehensive Automobile Liability insurance including owned, hired, and non-owned automobiles with limits not less than $1,000,000 combined single limit per accident.

00700.21.4.4 AIRCRAFT - The Contractor using its own aircraft or employing aircraft in connection with the Work performed under these Contract Documents shall maintain Aircraft Liability Insurance with a combined single amount of not less than $1,000,000 per occurrence.

00700.21.4.5 PROPERTY - Unless otherwise provided, the Contractor shall purchase property insurance in an amount equal to the initial Contract Price plus any subsequent modifications thereto for the entire Work of the Project on a replacement cost basis with any applicable deductibles not to exceed $5,000.

Property insurance shall be on an all-risk form. It shall provide extended coverage and shall insure against the perils of fire and physical loss or damage including, without duplication of coverage, flood, earth movement, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings, and debris removal including demolition occasioned by enforcement of any applicable requirements. It shall include reasonable compensation for Engineer's services required as a result of such insured loss. Coverage for other perils shall not be required unless otherwise called for in the Contract Documents.

Such property insurance shall be maintained, unless otherwise provided in the Contract Documents, or otherwise agreed to in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Owner has an insurable interest in the Work to be covered. This insurance shall include interests of the Owner, the Contractor, and subcontractors in the Work. The form of this policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributed thereto.

Unless otherwise provided in the Contract Documents, and with written approval of the Owner, this property insurance shall cover portions of the Work stored off the site, at the value established in the approval, as well as portions of the Work in transit.

00700.21.5 MAINTENANCE OF INSURANCE

Unless otherwise provided, all required insurance shall remain in force during the entire Contract Time.

00700.21.6 ARRANGEMENT OF POLICIES

Any policy required by this section may be arranged under a single policy for the full limit required, or by a combination of underlying policies with the balance provided by an Excess or Umbrella Liability Policy.

00700.21.7 ADDITIONAL INSURED

All liability insurance policies required hereunder shall provide that the Owner, Engineer and all departments, authorities and instrumentalities, and while acting within the scope of its duties, all of its elected or appointed officers, employees and authorized volunteers as well as advisory committees, shall be named as additional insured. Such policies shall also provide that coverage for the above insured is primary and not contributing.

00700.21.8 INSOLVENCY OF INSURER

Irrespective of the requirements as to insurance to be carried by the Contractor as provided herein; insolvency, bankruptcy, or failure of any insurance company to pay all claims accruing, shall not be held to relieve the Contractor of any obligations hereunder.

00700.22 CONTRACT SECURITY

00700.22.1 PROVISION OF BONDS

The Contractor shall within ten (10) days after the receipt of the Notice of Award, furnish the Owner with a Performance Bond and a Payment Bond in penal sums equal to the amount of the Contract Price, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions, and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the execution of the Work provided by the Contract Documents. Such bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the state in which the Work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the Contractor.

00700.22.2 BANKRUPTCY OF SURETY

If at any time a surety on any such Bond is declared bankrupt or loses its right to do business in the state in which the Work is to be performed or is removed from the list of Surety Companies accepted on Federal bonds, Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments to the Contractor shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable Bond to the Owner.

00700.23 ASSIGNMENTS

Neither the Contractor nor the Owner shall sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of its right, title, or interest therein, or its obligations thereunder, without written consent of the other party.

00700.24 INDEMNIFICATION

00700.24.1 OWNER AND ENGINEER HELD HARMLESS

In addition to indemnification provisions of the Contract, the Contractor will indemnify and hold harmless the Owner and the Engineer and its agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, and subcontractor or supplier, anyone directly or in-directly employed by any of them or anyone for whose acts any of them may be liable.

00700.24.2 WORKMAN’S COMPENSATION AND EMPLOYEE BENEFITS

In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any

of them or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workmen's compensation acts, disability benefit acts or other employee benefits acts.

00700.24.3 ENGINEER LIABILITY

The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, its agents or employees arising out of the preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs or Specifications.

00700.25 SEPARATE CONTRACTS

00700.25.1 OTHER PROJECT CONTRACTS

The Owner reserves the right to let other contracts in connection with this Project. The Contractor shall afford other contractors' reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate the Work with theirs. If the proper execution or results of any part of the contractor's work depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results.

00700.25.2 ADDITIONAL PROJECT RELATED WORK

The Owner may perform additional work related to the Project, or the Owner may let other contracts containing provisions similar to these. The Contractor will afford the other contractors who are parties to such contracts (or the Owner, if the Owner is performing the additional work) reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate the contractor's work with theirs.

00700.25.3 WRITTEN NOTICE OF ADDITIONAL WORK

If the performance of additional work by other contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by the Owner or others involves the Contractor in additional expense or entitles it to an extension of the Contract Time, the Contractor may make a claim therefor as provided in Subsections 00700.14 and 00700.15 of these General Conditions.

00700.26 SUBCONTRACTING

The Contractor may utilize subcontractors under the following conditions:

- The Contractor may utilize the services of specialty subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty subcontractors.
- The Contractor shall not award work to subcontractor(s), in excess of fifty (50%) percent of the Contract Price, without prior written approval of the Owner.
- The Contractor shall be as fully responsible to the Owner for the acts and omissions of its subcontractors and suppliers, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by itself.
- The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the Work of subcontractors and to give the Contractor the same power

as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

- Nothing contained in this Contract shall create any contractual relation between any subcontractor or supplier and the Owner.

00700.27 ENGINEER'S AUTHORITY

The Engineer shall act as the Owner's representative during the construction period and shall otherwise perform as follows:

- The Engineer shall decide questions which may arise as to quality and acceptability of materials furnished and work performed.
- The Engineer shall interpret the intent of the Contract Documents in a fair and unbiased manner.
- The Engineer will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.
- The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.
- The Engineer shall promptly make decisions relative to interpretation of the Contract Documents.
- The Engineer will carefully enforce the intent of the Contract Documents in regard to the quality of materials, workmanship and execution of the Work. Inspections may be made at the factory or fabrication plant of the source of material supply, when determined necessary by the Engineer.

00700.28 LAND AND RIGHTS-OF-WAY

00700.28.1 OWNER’S RESPONSIBILITY

Prior to issuance of Notice to Proceed, the Owner shall obtain all land and rights-of-way necessary for carrying out and for the completion of the Work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed. The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

00700.28.2 CONTRACTOR’S RESPONSIBILITY

The Contractor shall provide at its own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities or for storage of materials.

00700.29 GUARANTEE

The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date Notice of Substantial Completion (for items not affected by any punchlist requirements) or the date of the Notice of Final acceptance (for items completed or addressed following Substantial Completion). The Contractor warrants and guarantees for a period of one (1) year from the applicable date noted above that the completed Work is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the Work resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

00700.30 ARBITRATION

00700.30.1 DECISION BY ARBITRATION

All claims, disputes, and other matters in question arising out of, or relating to, the Contract Documents or the breach thereof, except for claims which have been waived by making an acceptance of final payment as provided by Subsection 00700.20 of these General Conditions, may be decided by arbitration if the parties mutually agree. Any agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered into any court having jurisdiction thereof.

00700.30.2 WRITTEN REQUEST FOR ARBITRATION

Notice of the request for arbitration shall be filed in writing with the other party to the Contract Documents and a copy shall be filed with the Engineer. Request for arbitration shall in no event be made on any claim, dispute, or other matter in question which would be barred by the applicable statute of limitations.

00700.30.3 CONTINUATION OF WORK

The Contractor will carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed to in writing.

00700.31 TAXES

The Contractor will pay all sales, consumer, use and other similar taxes required by the law of the place where the Work is performed.

01019.1 DESCRIPTION

This Section covers measurement and payment practices utilized by Sunrise Engineering in performing its contract management services according to the requirements of these Specifications and other parts of the Contract Documents.

01019.2 MEASUREMENT

01019.2.1 METHODS

The method of measurement and computations to be used in determination of quantities of material furnished, and of work performed under the Contract, will be those methods generally recognized as conforming to good engineering practice.

When items of improvement, equipment, or service referred to herein as "work" are shown on the plans and/or called for in the specifications for the Contractor to furnish, install, or provide, the items of work shall be measured and paid for in one of two ways. First, if the item of work is considered incidental to other items in the Bid Schedule, no separate measurement and payment shall be made and no separate bid item in the bid schedule will appear. In this case measurement and payment for this work shall be included by the Contractor in other bid items on the bid schedule. Second, when shown separately on the bid schedule, the item of work shall be measured as called for in the specifications and paid for at the contract unit price for that work.

01019.2.2 ACCURATE PRICING

The Bidder shall include a price for all bid items in the Bid Schedule and the Schedule of Values if required. Failure to do so may render the Bid non-responsive and may cause its rejection. All bids will be checked for errors. In the event the total "amount" indicated on the Bid schedule for a bid item does not equal the product of the unit price times the estimated quantity, the unit price shall govern, and the amount will be corrected accordingly. In the event the Bid Total does not agree with the sum of the prices bid on the individual bid items, the individual item prices shall govern and the total for the Bid schedule will be corrected accordingly. The Contractor shall be bound by any such corrections. For "Lump Sum" bid items, where applicable, the total shown on the Schedule of Values shall equal the amount entered for the corresponding bid item on the Bid schedule.

01019.2.3 U.S. STANDARD MEASURE

All work completed under this Contract will be measured by U.S. standard measure for the units described herein. Work performed by the Contractor will be measured in those units in accordance with the procedure described herein.

01019.2.4 MEASUREMENT BY ENGINEER

Since the quantities appearing on the Bid Schedules are approximate only and are prepared for the comparison of bids, all work and materials are subject to measurement by the Engineer. Measurement of work performed by the Contractor on Bid items with unit prices other than "lump sum" will be for the actual quantities of work performed and accepted, or material furnished in accordance with the Contract. In the case of lump sum bid items, the Engineer will verify that all of the work represented by the bid item has been completed.

01019.2.5 VARIATIONS IN QUANTITIES OF WORK

The scheduled quantities of work to be done and materials to be furnished may each be increased, decreased, or omitted at the Owner's discretion.

01019.2.6 MEASUREMENT BY LUMP SUM

The term "Lump Sum" when used as a unit of measurement for a specific improvement or separate component of a unit shall include all work necessary to complete that entire unit, including all necessary fittings and accessories delineated by the pay limits as shown on the Drawings. If no pay limits are shown on the Drawings, then the improvement shall include all fittings and accessories within 5-feet of the item.

01019.2.7 MEASUREMENT BY LINEAL FOOT

All work measured by the lineal foot shall be measured parallel to the centerline. For water and gas piping, no deduction will be made for valve, fittings or carrier pipe. For sewer collection piping, measurement shall be to the inside surface of connecting manholes. Piping connected to structures, except headwalls, shall be measured to a point five (5) feet outside of that structure, unless indicated otherwise on the Drawings.

A station, when used as a unit of measurement, will be 100 lineal feet.

Items measured by the lineal foot; such as pipe culverts, guardrail, under-drains, etc., will be measured parallel to the base or foundations upon which structures are placed.

The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fractions of inches.

01019.2.8 MEASUREMENT BY AREA

Area computations will be made from actual horizontal and transverse measurements made on the site of the work.

Structures will be measured to the neat lines shown on the plans or as altered to fit site conditions.

Lumber will be measured by the thousand feet board measure (M.F.B.M.) actually incorporated in the structure. Measurement will be based on nominal widths and thickness and the extreme length of each piece.

01019.2.9 MEASUREMENT BY VOLUME

In computing volumes of excavation, the average end area method will be used unless the Engineer and Contractor agree, in writing, to an alternate method.

Materials to be measured by volume or by load count shall be hauled in approved vehicles and measured at the point of delivery. Vehicles for this purpose may be of any size or type, provided the body is shaped so the actual volume may be readily and accurately determined.

When liquid bituminous materials are measured by the gallon or ton, volumes will be measured at 60° F, or will be corrected to the volume of 60 degrees F, using ASTM D 1250 for asphalt or ASTM D 633 for tars. When bituminous materials are shipped by truck or transport, net certified weights or volume subject to correction for loss or foaming, may be used for computing quantities.

01019.2.10 MEASUREMENT BY WEIGHT

The term "ton" will mean the short ton of 2,000 pounds avoirdupois.

When measurement units require weighing materials for payment, the Contractor shall be responsible for providing weight measurement from commercial certified scales or from scales provided at the job site which are certified in the state wherein the work is located.

Cement will be measured by the ton or hundredweight.

01019.2.11 CONVERSION OF WEIGHT TO VOLUME

When requested by the Contractor and approved by the Engineer in writing, materials specified to be measured by the cubic yard may first be weighed and the weight converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Engineer and agreed to by the Contractor before this method of measurement of quantities is used.

01019.2.12 SPECIFIC MANUFACTURED ITEMS

When standard manufactured items are specified; such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit, weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerance in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

01019.2.13 RENTAL EQUIPMENT

Rental of equipment will be measured in hours of actual working time and necessary traveling time of the equipment within the limits of the project. If equipment is ordered held on the project on a standby basis by the Engineer, the agreed rental rate, minus the labor and fuel costs, will be paid.

01019.2.14 MEASUREMENT BY EACH

All work measured by each shall be an an individual or single unit.

01019.3 PAYMENT

01019.3.1 SCOPE OF PAYMENT

The Contractor shall receive and accept compensation provided in the Contract as full payment for:

- Furnishing all materials, labor, equipment, tools, transportation and incidentals required for completion of work.
- All loss or damage due to the nature of the work, action of the elements and unforeseen difficulties until final acceptance by the Engineer, subject to the provisions of the General Conditions.
- All costs arising from any infringement of a patent, trademark or copyright.
- Bids shall include all sales tax and all other applicable fees.

01019.3.2 NON-PAYMENT

No payment will be made for:

- Work which is in excess of that described in the Contract Documents.

- Removal and replacement of defective work.
- Loss of anticipated profits.

01019.3.3 LUMP SUM

The term "lump sum", when used as a unit for payment, shall include all work required to complete the item, including all necessary fittings and accessories, as described in the Bid Schedule.

01019.3.4 FULL PAYMENT

The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials and for performing all work under the Contract in a complete and acceptable manner and for all risk, loss, damage or expense of whatever character arising out of the nature of the work or the execution thereof.

01019.3.5 VARIATION IN QUANTITY OF WORK

The Owner reserves the right to make variations in quantities by adding to, or deleting from, quantities listed in the bid schedule in order to match the total bid with the money available in the budget.

01030.1 DESCRIPTION

This section covers project meetings including the pre-construction meeting and other progress and/or work coordination meetings conducted to provide communication and awareness to all parties associated with the Contract.

01030.2 PRE-CONSTRUCTION CONFERENCE

Prior to the commencement of work at the site, a pre-construction conference will be held at a mutually agreed time and place to be arranged by the Engineer. The Engineer shall also provide notification to all parties expected to attend the meeting. Attendees will include the following:

- Engineer
- Project Inspector
- Owner/Owner's Representative
- Contractor/Contractor's Representative/ Subcontractors as appropriate
- Governmental Representatives as appropriate (State, County, Municipal, etc.)
- Manufacturer/Supplier Representatives/Adjoining Contractors, as appropriate.
- Utility Service Representatives as appropriate.

01030.2.1 Unless previously submitted to the Engineer, the Contractor shall bring to the conference one copy each of the following:

- Contract construction schedule in accordance with the General Conditions.
- Procurement schedule of major equipment and materials and items requiring long lead-time.
- Shop Drawings, samples or substitution proposals for items proposed as substitutions or "or equal" items.
- Schedule of work that includes the anticipated monthly payment amounts during the contract.
- A Schedule of Values of work to be paid for as lump sum items where partial payment is anticipated.

01030.2.2 The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda may include but not be limited to the following items:

- Contractor's Work Schedule.
- Transmittal, review, distribution and approval of Contractor's submittals.
- Processing of applications for payment.
- Maintaining records and documents.
- Critical work sequencing.
- Field decisions and Change Orders.
- Use of project site, office and storage areas, security, housekeeping, and Owner's needs.
- Major equipment deliveries and priorities.
- Interpretation of Drawings and Specifications.
- Contractor's responsibilities for safety, first-aid and sanitation.

01030.2.3 The Engineer will preside at the pre-construction conference and will arrange for keeping minutes and distributing them to all attendees to the meeting.

01030.3 PROGRESS/COORDINATION MEETINGS

01030.3.1 The Contractor shall conduct regular on-site progress and coordination meetings at least weekly and at other times as requested by Engineer or as required by progress of the work. The Contractor, Engineer, and all Subcontractors active on the site shall be represented at each

meeting. The Contractor may, at its discretion, request attendance by representatives of its suppliers, manufacturers, and other Subcontractors. The Contractor shall be responsible for providing written notification to those deemed necessary for attendance at least 36 hours prior to the time set for the meeting.

01030.3.2 The Contractor shall preside at the meetings and maintain a file of minutes of the proceedings. The purpose of the meetings will be to review the progress of the work, maintain coordination of effort, discuss changes in scheduling, and resolve other problems which may develop.

01090.1 DESCRIPTION

Wherever in these Specifications references are made to the standards, specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronyms or abbreviations only. As a guide to the user of these Specifications, the following acronyms or abbreviations, which may appear herein, shall have the meanings indicated below.

01090.1.1 DEFINITIONS OF ABBREVIATIONS AND ACRONYMS

AAR	Association of American Railroads
AASHTO	American Association of the State Highway and Transportation Officials
ACI	American Concrete Institute
ADC	Air Diffusion Council
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute, Inc.
APWA	American Public Works Association
ARI	Air Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASQC	American Society of Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BLM	Bureau of Land Management (U.S. Department of Interior)
CDA	Copper Development Association
CEMA	Conveyor Equipment Manufacturer's Association
CGA	Compressed Gas Association
CFR	Code of Federal Regulations
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CS	Commercial Standard of NBS (U.S. Dept. of Commerce)
CTI	Cooling Tower Institute
DIP	Ductile Iron Pipe
EIA	Electronic Industries Association
EPA	U. S. Environmental Protection Agency
ETL	Electrical Test Laboratories
FEMA	Federal Emergency Management Administration
FERC	Federal Energy Regulatory Commission
FS	Forest Service (U.S. Department of Agriculture)
FWS	Fish and Wildlife Service
GI	Galvanized Iron
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
ID	Inside Diameter
IEEE	Institute of Electrical and Electronics Engineers

IES	Illuminating Engineering Society
IMC	International Mechanical Code
IME	Institute of Makers of Explosives
IPC	International Plumbing Code
ISA	Instrument Society of America
ISO	International Organization for Standardization
MBMA	Metal Building Manufacturer's Association
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFGC	National Fuel Gas Code
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NRCS	Natural Resources Conservation Service (U.S. Department of Agriculture) (formerly SCS)
NSF	National Sanitation Foundation
OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PDI	Plumbing and Drainage Institute
PE	Polyethylene
PVC	Polyvinyl Chloride
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SMACNA	Sheet Metal and Air Conditioning Contractor’s National Association
SSPWC	Standard Specification for Public Works Construction
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
UPRR	Union Pacific Railroad
USDARD	Rural Development (U.S. Department of Agriculture) (formerly Farmers Home Administration)
WCRSI	Western Concrete Reinforcing Steel Institute
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

01090.2 REFERENCED WORKS, CODES AND STANDARDS

Whenever references to specifications, codes, standards and other publications are made to these Specifications, the following rules shall apply:

01090.2.1 TITLES OF SECTIONS AND PARAGRAPHS

Titles of sections and/or paragraphs shown in these Specifications are for convenience of reference only, and do not form a part of the Specification.

01090.2.2 APPLICABLE PUBLICATIONS

Whenever references in these specifications are made to published specifications, codes, standards, or other requirements, it shall be understood that unless a date is specified, only the latest edition of these specifications, codes, and/or standards which have been published as of the date that the work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No

requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.

01090.2.3 SPECIALISTS AND SPECIAL ASSIGNMENTS

In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such direction shall be recognized as special requirements and is not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" and qualified for the assignment of the work. Nevertheless, the final responsibility for fulfilling this assignment remains with the Contractor.

01090.2.4 BUILDING CODES

Reference herein to "Building Code" shall mean the Uniform Building Code issued by the International Conference of Building Officials (ICBO). The latest edition of the code as approved and used by the local agency as of the date of award, as adopted by the agency having jurisdiction, shall apply to the work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

01090.2.5 OSHA

01090.2.5.1 OSHA REGULATIONS - References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

01090.2.5.2 OSHA STANDARDS - References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards of the U.S. Code of Federal Regulations, including all changes and amendments thereto.

01090.2.6 DOT STANDARDS/SPECIFICATIONS

References to "State DOT Specifications" or "State DOT Requirements" shall mean the Specifications for Excavation on State Highway Right-of-Way and/or Standard Specifications for Road and Bridge Construction, including all amendments thereto, issued by the State agency responsible for highways wherein the Contract is located and any other written requirements or provisions issued by that agency which are contained in these Contract Documents.

01090.2.7 FEDERAL PIPELINE SAFETY STANDARDS

Reference to "Federal Pipeline Safety Standards" shall mean Title 29, Parts 191 and 192, Federal Pipeline Safety Minimum Standards, U.S. Code of Federal Regulations including all changes and amendments thereto.

01090.2.8 STATE GAS PIPELINE SAFETY STANDARDS

References to "State Gas Pipeline Safety Standards" shall mean the appropriate section/s of the legal code or regulations adopted in the State wherein the work is located, including all changes and amendments thereto.

01090.3 STANDARDS IMPOSED BY OTHER AGENCIES OR ORGANIZATIONS

01090.3.1 PROPERTY BELONGING TO OTHER AGENCIES OR ORGANIZATIONS

Construction may occur on property owned or administered by agencies or organizations other than the Owner, such as federal and/or state departments of transportation, the U. S. Forest Service, the U. S. Bureau of Land Management, the U.S. Fish and Wildlife, counties, canal companies, irrigation companies, utility companies, other federal and state agencies, municipal governments, etc. Work which is to take place on such property may be required to be in accordance with special construction requirements of that agency or organization as well as these specifications.

01090.3.2 ADDITIONAL INFORMATION AND SPECIFICATIONS

Information will be provided on the plans to indicate areas of the Work which fall on property owned or administered by agencies and organizations other than the Owner. Specifications from agencies which are affected by the work will be provided in the Appendix to the Contract Documents. Those specifications provided in the Appendix shall be considered part of the Contract Documents and the Contractor shall include sufficient compensation in its bid to cover the work required for compliance thereto.

01090.4 CONFLICTS

In case of conflict between codes, reference standards, Drawings and the other Contract Document, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or labor required therefrom. The Contractor shall assume the most stringent requirements apply when preparing bids for this Contract.

CONTRACT CLOSEOUT — SECTION 01200

01200.1 DESCRIPTION

The purpose of this section is to clarify certain aspects of the Project and the Contract that must be taken into consideration and completed before final acceptance of the Work can be given. These items include cleanup, demonstration of acceptable performance of equipment and facilities furnished and installed, submittals, payment for all work completed, issuance of final acceptance documentation, accepted repair and restoration of work and materials found defective during the warranty period. Specific instructions are provided herein for completion of the Work in such a manner that it will be fully acceptable and that the Contractor will be eligible for receipt of final payment.

01200.1.1 RELATED WORK AND REFERENCED SECTIONS

Not used.

01200.1.2 SUBMITTALS

Section 01300 - Submittals
See paragraph 01200.3.5 below.

01200.1.3 DEFINITIONS

Not used.

01200.2 MATERIALS

Not used.

01200.3 CONSTRUCTION REQUIREMENTS

01200.3.1 CLEANUP

The Owner will not give final acceptance of the Work until the Contractor has satisfactorily complied with the finishing and cleanup requirements contained in these Contract Documents and with any applicable local regulations. The Contractor shall accomplish the cleanup operations so as to leave the work site in an orderly, acceptable, and presentable condition.

01200.3.2 REPAIR AND RESTORATION

All major and minor damage to improvements and finished surfaces resulting from the Contractor's performance of the Work, whether to materials and equipment located on the project site or to those constructed under this Contract, shall be repaired to an original, or like-new, condition before final acceptance will be provided by the Engineer and Owner. Where damage to surfaces or materials can not be sufficiently repaired or restored, in the opinion of the Engineer, the Contractor may be required to replace the entire surface covering or structural member to achieve an original or like-new condition of the surface or material.

01200.3.3 TESTING

All performance and operational testing of facilities and equipment required by the Contract Documents, together with any required supportive documentation, shall be completed by the Contractor and approved by the Engineer prior to final acceptance of the Work.

01200.3.4 ACCEPTANCE FROM PROPERTY OWNER

The Contractor shall obtain a written release from each property owner on whose property work has been required by these Contract Documents. Such release shall indicate the property Owner's approval of the restoration and/or replacement of all disturbed improvements, surfaces and structures. Any request made to the Contractor by a private property owner, and determined to be unreasonable in the opinion of the Engineer, may be waived by the Owner.

01200.3.5 SUBMITTAL OF MANUFACTURER'S DOCUMENTATION

All guarantees and warranties, operation and maintenance manuals or brochures, or other materials furnished to the Contractor by the manufacturer for any equipment or material used for the Work shall be delivered to the Owner in protective 3-ring binders. Retainage held to the Contractor in accordance with the General Conditions of the Contract Documents will not be released until such documentation is submitted. See Section 01300 for more detail regarding O&M manuals.

01200.3.6 FINAL ACCEPTANCE

01200.3.6.1 CONTRACTOR'S STATEMENT OF COMPLETION - When the Contractor has completed the Work under this contract, including all of the Contractor's testing and clean-up, the Contractor shall inform the Engineer in writing that the Work has been completed and request a final inspection by the Engineer. The Engineer will then conduct a final inspection with the Owner and representatives of the pertinent funding and regulatory agencies. If items are found by the Engineer to be incomplete or not in compliance with the contract requirements, the Engineer will inform the Contractor of such items. After the Contractor has completed these items, the procedure shall then be the same as described above for the Contractor's statement of completion and request a final inspection.

01200.3.6.2 NOTICE OF FINAL ACCEPTANCE - After the Engineer has determined that all work required under the Contract Documents has been completed and that all of the considerations specified herein above are satisfactorily concluded, the Engineer will recommend to the Owner, in writing, that final acceptance of the entire Work under this contract be made as of the date of the Engineer's final inspection. The Owner and Engineer will then indicate formal approval and acceptance of the Work by issuing the "Notice of Final Acceptance" form.

01200.3.6.3 NO PARTIAL ACCEPTANCE - Unless otherwise required by Special Provisions, partial acceptance of any portion of the Work will not be made. While Substantial Completion notice can be issued in accordance with the General Conditions to allow use of completed work for its intended purpose, no acceptance other than the final acceptance of all completed work will be made. No inspection or approval or Notice of Substantial Completion pertaining to specific parts of the work shall be construed as final acceptance of any part until written final acceptance of all work is issued.

01200.4 METHOD OF MEASUREMENT

Not used.

01200.5 BASIS OF PAYMENT

Not used.

01300.1 DESCRIPTION

This section covers procedures to be followed by the Contractor when providing information to the Owner and/or Engineer to obtain approval of materials, equipment, procedures, etc. described in the Specifications and Drawings.

01300.2 SHOP DRAWINGS AND MATERIALS SUBMITTALS

01300.2.1 NUMBER OF COPIES OF SUBMITTALS

The Contractor shall furnish six (6) copies of each shop drawing and pertinent materials information sheet to the Engineer for review. A full set of submittals shall be provided to the Engineer seven (7) days prior to commencement of construction activity. Following review and approval, two copies shall be returned to the Contractor for his records, two shall be retained by the Engineer for inspection and verification purposes, and two shall go to the Owner as working and archival records.

01300.2.2 SHOP DRAWINGS

01300.2.2.1 CONTRACTOR REVIEW - The Contractor's shop drawing submittals shall be reviewed by a qualified representative of the Contractor, prior to submission to the Engineer. Such review shall be made to ensure the accuracy and compliance with the technical requirements and performance described and illustrated in the Drawings and Specifications.

01300.2.2.2 CONTENT - Shop drawings shall include drawings, pictures and sketches with sufficient details and explanations to reflect the Contractor's interpretations of components and required configurations not shown on the drawings, so that a documented record of such can be approved for incorporation in the Work. These drawings shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items and unit assemblies in relation to the Drawings and/or Specifications.

01300.2.2.3 TIMELY SUBMITTAL - Shop drawings shall be submitted sufficiently in advance to allow the Engineer not less than ten regular working days prior to manufacturing for examining the drawings.

01300.2.2.4 ENGINEER APPROVAL - When the shop drawings are approved by the Engineer, two sets of copies will be returned to the Contractor marked "Approved", "Revise as Noted", "Rejected", "Approved Except as Noted", or similar notification. If changes or corrections are necessary, one set will be returned to the Contractor with such changes or corrections indicated by a brief statement, and the Contractor shall correct and resubmit the drawings, in triplicate, to the Engineer.

Fabrication work shall not commence until the Engineer has reviewed the pertinent shop drawing/s and returned copies to the Contractor marked either "Approved" or "Approved - Except as Noted". Corrections indicated on such submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis of claims for extra work.

Approval of shop drawings will not be required for reinforcing steel that is detailed by the Contractor in accordance with the Plans and Specifications. Any change from the Plans and Specifications made by the Contractor in any aspect of the Work shall be approved by the Engineer in a written Change Order prior to any work being altered from that already approved for construction.

001300.2.3 MATERIALS INFORMATION SUBMITTALS

In keeping with 01300.2.1 above, the Contractor shall assemble and submit six (6) original copies of each manufacturer's catalog cuts and materials information sheets pertaining to materials and equipment to be furnished and installed in the Work. These submittals shall be enclosed in 3-ring binders. Failure to submit all materials information may result in the Contractor's partial payments to be withheld until submittals are complete. Photocopies of the catalog cuts and information sheets will not be acceptable as submittals without prior authorization from Engineer.

01300.2.4 CONTRACTOR LIABILITY

The Contractor shall assume all responsibility and risk for any re-work or other costs resulting from errors in Contractor submittals. The Contractor shall be responsible for showing accurate dimensions and details of connections required to ensure the function of the equipment and/or component of the Work being illustrated.

01300.3 SAMPLES

01300.3.1 NUMBER OF SUBMITTALS

Whenever requested by the Engineer, the Contractor shall submit at least one sample of each item or material indicated in the Specifications to the Engineer for inspection and acceptance and do so at no additional cost to the owner.

01300.3.2 TIMELY AND ORDERLY SUBMITTAL

Samples shall be submitted sufficiently in advance of placement of orders that the Engineer shall have not less than ten regular working days for examining and testing the material for acceptance prior to delivery to the job site. Samples shall be submitted in an orderly sequence and appropriately identified so that dependent materials or equipment can be assembled and reviewed without causing delays in the work or mistakes in their identity.

01300.3.3 SELECTION OF COLORS AND TEXTURES

Unless otherwise specified, the Owner and the Engineer will select all colors and textures of specified items from the manufacturer's standard colors and standard materials, products, or equipment lines.

01300.4 OPERATIONS AND MAINTENANCE MANUALS

01300.4.1 STRUCTURE OF OPERATIONS AND MAINTENANCE MANUALS

The Contractor shall furnish to the owner four (4) identical sets of Operations and Maintenance manuals. Each set shall consist of one or more volumes, each of which shall be bound in a standard size, 3-ring, loose-leaf, vinyl plastic, hard cover binder suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches. A table of contents shall be provided which indicates all equipment in the Operations and Maintenance manuals.

01300.4.2 CONTENTS

The Contractor shall include in the Operations and Maintenance Manuals the following information for each item of mechanical, electrical, and instrumentation equipment:

- Care and maintenance of all finished exposed surfaces.

- Complete operating instructions, including location of controls, special tools or other equipment required, related instrumentation, and other equipment needed for operation.
- Preventive maintenance procedures and schedules.
- Complete parts lists, by generic title, identification number, and catalog number, complete, with exploded views of each assembly.
- Disassembly and reassembly instructions.
- Name and location of nearest supplier and spare parts warehouse.
- Name and location of manufacturer.
- Recommended start-up, testing and troubleshooting procedures.
- Prints of the record drawings, including diagrams and schematics, as required under the electrical and instrumentation portions of these specifications.

01300.4.3 SCHEDULE OF DELIVERY

Operations and Maintenance manuals shall be submitted in final form to the owner before seventy-five (75) percent of the Work is completed. Any discrepancies found by the owner and Engineer in the Operations and Maintenance manuals shall be corrected by the Contractor prior to final acceptance of the project.

01300.5 SCHEDULE OF VALUES

At the time of the pre-construction conference, the Contractor shall submit a Schedule of Values of the Work measured as lump sum bid items. On the Schedule, those items shall be subdivided into component parts in sufficient detail as to form a basis for determining progress payments during construction. Quantities, and/or prices, shown on the Schedule shall equal the total contract price for each lump sum item. Information provided on the Schedule will be reviewed and approved by the Engineer when found acceptable. That information will then be incorporated into the data used for preparing the Application for Payment by the Engineer.

01300.6 CONTRACT CONSTRUCTION SCHEDULE

A construction schedule, prepared in accordance with requirements of the General Conditions, shall be submitted to the Engineer at the pre-construction conference. Unless required otherwise in Special Provisions, such schedule shall show the anticipated time of completion, approximate start dates of identifiable segments of the Work, and anticipated value of the work expected to be completed in monthly time periods within the contract period.

01300.7 PROCUREMENT SCHEDULE

At the time of the pre-construction meeting (see Section 01030), the Contractor shall submit a procurement schedule to the Engineer. This plan shall include all equipment and materials required for the Work included in the Contract that are not readily available and will require off-site manufacture and lead time which can affect the progress of the Work. The plan shall show at least the following information:

- Equipment/Material Name
- Anticipated amount of time for ordering, manufacturing, and shipping to Work site.

- Anticipated dates for ordering, receiving and installing.

01300.8 CONSTRUCTION PHOTOGRAPHY RECORDS

When required in the Contract Documents and prior to commencement of any of the Work, the Contractor shall prepare colored CD photography records of all areas of the Contract work site and provide copies of such records to the Engineer. Such records shall become the property of the owner and may be used for determining the condition of work site/s and degree of restoration required for completion of the Work (see also Section 2000).

01400.1 DESCRIPTION

This section covers quality control of all work and activities on the part of the Owner, the Engineer, and the Contractor, to ensure compliance with these Specifications and the requirements of the Contract.

01400.2 ASSIGNMENT OF RESPONSIBILITY

01400.2.1 THE CONTRACTOR

The Contractor has primary responsibility for ensurance of quality control of the Work provided under the Contract. Therefore, any omission or failure on the part of the Engineer to notify the Contractor of, or to condemn defective work and/or materials at the time of construction shall not be taken as acceptance of the work or materials, and the Contractor will be required to correct any defective work or materials prior to final acceptance.

01400.2.2 THE OWNER AND ENGINEER

The Engineer will endeavor to locate any errors or defective materials or workmanship, and call them to the attention of the Contractor prior to subsequent work being performed. However, the Engineer is under no obligation to do so, and neither the Owner, nor the Engineer shall be held liable for errors, or defective material, or defective workmanship performed by the Contractor and not discovered by the Engineer prior to subsequent work being performed.

01400.2.3 CORRECTIONS

Prior to execution of the Agreement, the Engineer may correct errors and omissions to these Contract Documents by issuing Addenda. After execution of the Agreement, correction of errors, omissions or other changes necessitated shall be made in accordance with the General Conditions (Section 00700).

01400.3 QUALITY OF MATERIALS

01400.3.1 COMPLIANCE WITH SPECIFICATIONS

All materials and equipment incorporated in the Work shall be of new manufacture and shall be of the grade and quality described by these Specifications and the Special Provisions.

01400.3.2 SPECIFIED MATERIALS

Where a specific brand or manufacturer's equipment, model, system, or etc. is specified in these Specifications, no intention is made to be exclusive or limit competition, but rather to set forth the minimum standards for quality and performance.

01400.3.3 SUBSTITUTION OF MATERIALS

The Engineer, in accordance with the General Conditions (Section 00700.8), may allow substitution of equipment or materials. The Owner reserves the right to reject substitutions if, in his opinion, the proposed substitutions will not achieve comparable equipment installation and performance standards.

01400.4 QUALITY OF WORK

All workmanship incorporated in the Work covered by the Contract is to be of the grade and quality described by these Specifications and the Special Provisions.

01400.5 OBSERVATION

01400.5.1 AUTHORITY AND DUTIES OF OBSERVERS

01400.5.1.1 AUTHORITY - Observers representing the Engineer are authorized to observe all work performed and all materials furnished and to reject defective material and any work that is improperly performed, subject to the final decision of the Engineer. This authority extends to all or any part of the Work, including the preparation, fabrication, or manufacture of any materials or equipment to be used for completion of the Work. The Observers is not authorized to alter or waive the provisions of these Specifications or other provisions of the Contract Documents. The Engineer may delegate additional authority to the Observers when such action is determined to be necessary.

01400.5.1.2 DUTIES - Observers keep the Engineer informed as to the progress of the Work and the manner in which it is performed. Observers are also assigned to call the Contractor's attention to any observed nonconformance with the Contract Documents. The Observer will not act as foreman for the Contractor.

01400.5.2 OBSERVATION OF MATERIALS

01400.5.2.1 TESTING - In accordance with the Contract Documents and at the option of the Engineer, materials to be supplied under this contract will be tested and/or inspected either at their place of origin or at the site of the Work. The Contractor shall give the Engineer written notification well in advance of actual readiness of materials to be tested and/or inspected at the point of origin. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the material nor shall it preclude re-testing or re-inspection at the site of the Work.

01400.5.2.2 SAMPLES - The Contractor shall furnish such samples of materials as are requested by the Engineer, without charge. No material shall be incorporated into the Work until the Engineer has approved it (see Section 01300).

01400.5.3 CONTRACTOR LIABILITY

The observation of the Work shall not relieve the Contractor of any of its obligations to fulfill its contract as herein provided, and unsuitable materials may be rejected notwithstanding that such unsatisfactory performance may have been overlooked and accepted or estimated for payment.

CHARACTER OF WORKERS, METHODS AND EQUIPMENT — SECTION 01500

01500.1 DESCRIPTION

Covers requirements for aptness, competency, quality, and quantity in the labor, equipment, tools, and materials supplied by the Contractor for execution of the Work.

01500.2 REQUIREMENTS

In order to bring the Work to completion in the manner and on the time schedule required by the Contract Documents, the Contractor shall provide sufficient labor and equipment with adequate training and capability as follows:

- The Contractor shall employ sufficient labor and equipment with adequate training and capability for executing the Work to full completion in the manner and time required by these Specifications.

- All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have appropriate training and sufficient experience in such work, in the opinion of the Engineer, to perform all work properly and satisfactorily.

- Any person employed by the Contractor or by any Subcontractor who, in the opinion of the Engineer, does not perform their work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed forthwith by the Contractor or Subcontractor employing such person. Such person(s) shall not be employed again in any portion of the Work without the approval of the Engineer. When such action is considered, and if requested by that employee, a hearing attended by the employee, Engineer, and Contractor shall be conducted before final dismissal action is taken.

- Should the Contractor fail to remove such person or persons as required above or fail to furnish suitable and sufficient personnel for the proper execution of the Work, the Engineer may suspend the Work by written notice until such order is complied with.

- All equipment, which is proposed to be used on the Work, shall be of sufficient size and in such mechanical condition, in the opinion of the Engineer, as to produce a satisfactory quality of Work. Equipment used on any portion of the Work shall be fitted with appropriate protective devices in accordance with OSHA and other applicable safety regulations such that no injury to employees, the Work, or to adjacent property will result from its use.

- When the specific methods and equipment to be used by the Contractor in accomplishing the Work are not described in the Contract Documents, the Contractor is free to use any methods or equipment that will accomplish the Work in conformity with the requirements of this Contract.

PROTECTION OF EXISTING IMPROVEMENTS — SECTION 01510

01510.1 DESCRIPTION

This section covers measures and instructions for prevention of damage to existing structures and utilities, whether above ground or underground, during execution of the Work of the Contract.

01510.2 PROTECTION OF EXISTING UTILITIES

01510.2.1 INTEGRITY OF UTILITIES

The Contractor shall be responsible for safeguarding and maintaining the integrity of all conflicting utilities. This responsibility includes securing the assistance of available utility location services in the area in which the Work is being performed. The Engineer has attempted to show the location of all utilities anticipated to conflict with the Work. However, when a conflicting utility line is discovered that was not shown on the plans, the Contractor shall contact the utility's owner and notify the Engineer immediately for resolution of the conflict. When realignment or relocation of the Work, or relocation of the conflicting utility is deemed necessary, the Engineer shall give direction in writing for the Contractor to proceed. Work resulting from such direction may be treated as a changed condition, and appropriate authorization and payment will be made in accordance with the General Conditions.

01510.2.2 LOCATING UTILITIES

It shall be the responsibility of the Contractor to locate and expose or identify all existing utilities, both underground and overhead, for the purpose of preventing damage to them. The Contractor shall notify all concerned utility offices at least 48 hours in advance of construction operations in which a utility agency's facilities may be involved. This shall include, but not be limited to, irrigation water, culinary water, telephone, gas, and electric.

01510.2.3 CHANGES TO UTILITIES

The Contractor shall be responsible for any and all changes to, or re-connections to, public utility facilities encountered or interrupted during execution of the Work, and all costs related thereto shall be borne by the Contractor. The Contractor shall negotiate with, and pay, the respective utility agency for work it must do in connection with moving, repairing, or restoring its utility(s). The Contractor shall further make all necessary notifications, scheduling, coordination, and management of details related to any such interference. The potential or projected cost of any public utility interference shall be included in the Contractor's price covering the major Contract Item to which the interference or changes are attributable.

01510.2.4 MAINTENANCE OF SERVICE

01510.2.4.1 CONTINUOUS SERVICE - Unless otherwise required in the Contract Documents, all utilities, both underground and overhead, shall be maintained in continuous service throughout the entire contract period. The Contractor shall be responsible and liable for any damages to or interruption of service caused by the construction.

01510.2.4.2 ACCIDENTAL INTERRUPTION OF SERVICE - In the event of interruption of other utility services as a result of accidental breakage, the Contractor shall promptly notify the appropriate responsible authority. The Contractor shall then cooperate with that authority in restoration of service as soon as possible, and shall bear all cost of repair. In no case shall interruption of any water or other utility service be allowed outside working hours unless the Engineer has issued prior authorization. When changeover of service connections to new utility lines becomes necessary, interruptions of individual services for periods of up to 8 hours will be allowed providing 24 hour advance notice has been given to affected users.

01510.2.4.3 TEMPORARY INTERRUPTION AND RELOCATION - If the Contractor desires to temporarily or permanently relocate or shut down any utility or appurtenance, the Contractor shall make the necessary arrangements and agreements with the owner or operator of the respective utility and shall be completely responsible for all costs concerned with the relocation or shutdown and reconstruction. Shutdown and relocation and/or reconstruction shall be subject to inspection and approval by the Engineer and the owner of the utility.

01510.3 PROTECTION OF PROPERTY AND EXISTING STRUCTURES

01510.3.1 REMOVAL OR RELOCATION OF PROPERTY - All property removed or relocated by the Work shall be reconstructed in its original or new location as soon as possible. Restoration of existing property or facilities shall be to a condition as good or better than its original condition.

01510.3.2 DAMAGE TO PROPERTY - All property damaged by the Contractor, whether inside or outside the limits of easements provided by the Owner, shall be the responsibility of the Contractor. All such damages shall be repaired with like material and restored to its original condition, or better. Such repair or restoration shall be accomplished at the Contractor's expense without additional compensation from the Owner.

01510.4 PROTECTION OF PAVED SURFACES

To avoid unnecessary damage to paved surfaces, tracked equipment shall use rubber cleats or paving pads when operating on or crossing all existing paved surfaces unless authorized otherwise in writing by the Engineer.

01510.5 RIGHTS-OF-WAY AND EASEMENTS

01510.5.1 MINIMAL DISTURBANCE OF RIGHTS-OF-WAY - When construction easements have been obtained by the Owner, the Contractor shall take appropriate measures to minimize disturbances to surface improvements within the easements. The Contractor shall obtain a signed release from each property owner, approving restoration work in the construction easements across its respective property/s.

01510.5.2 CONSTRUCTION AREAS - The Contractor shall confine construction operations to the area within the dedicated rights-of-way for public thoroughfares, or within areas for which construction easements have been obtained, unless the Contractor has made separate special agreements with the affected property owners in advance.

01510.5.3 PROPERTY OWNER NOTIFICATION - The Contractor shall give at least 48 hours advance notification of commencement of construction to property owners having land on which construction will take place. During all construction operations, the Contractor shall construct and maintain such facilities as may be required to provide access by all property owners to their property. No one shall be cut off from access to their property for a period exceeding eight (8) hours unless the Contractor has made special arrangements with the affected persons. The Contractor shall grade all disturbed surfaces required for motor vehicle traffic at least daily unless directed otherwise in the Contract Documents or in writing by the Engineer.

01520.1 DESCRIPTION

This Section includes requirements that shall be followed by the Contractor, to protect the environment, while performing work under this contract. The Contractor shall also comply with any applicable additional requirements made by federal, state, or local government agencies.

01520.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 00700 – General Conditions, paragraph 32 (for RDA funded projects)

01520.1.2 SUBMITTALS

Section 01300 – Submittals.

01520.1.3 DEFINITIONS

Not used.

01520.2 MATERIALS

Not used.

01520.3 CONSTRUCTION REQUIREMENTS

01520.3.1 EXPLOSIVES AND BLASTING

The use of explosives on the work will not be permitted unless approved otherwise in the Contract Documents or in writing by the Engineer.

01520.3.2 DUST ABATEMENT

01520.3.2.1 CONTROL MEASURES - The Contractor shall furnish all labor, equipment, water and means required to provide effective dust control and abatement measures. Control measures shall be applied as often as necessary and wherever directed in writing by the Engineer, to prevent construction operations from producing dust in amounts that may be damaging to property, vegetation, or animals, or detrimental to persons within reasonable proximity of the work site.

01520.3.2.2 HAUL ROUTES AND WORK SITES - The Contractor shall identify haul routes or material handling areas, outside of the Work site, whereon dust may be generated, and shall exercise appropriate measures to abate any dust problem caused by its operation. Such dust abatement measures shall be taken immediately when observed or when required in writing by the Engineer.

01520.3.3 STORM AND GROUND WATER

01520.3.3.1 PERMITS REQUIRED - If a storm water NPDES permit is required, the Contractor is responsible to obtain such permit and comply with the conditions thereof.

01520.3.3.2 CONTROL MEASURES - The Contractor shall provide and maintain, at all times during construction, ample means and devices to promptly remove all water entering the Work, whether the water is surface or ground water. Water removed by the Contractor shall be directed into ponds or areas separated from live streams or drainage ways, to keep sediment from entering live water.

01520.3.3.3 DRAINAGE PATTERNS - In excavation, fill, and grading operations, the Contractor shall take care, to disturb the existing drainage pattern as little as possible. Particular care shall be taken not

to direct drainage water onto private property or into streets or drainage ways inadequate for the increased flow.

01520.3.3.4 FORDING OF WATERWAYS - Fording of live streams or any body of live water to accomplish the Work shall not be permitted. Mechanized equipment also shall not be operated in live water to accomplish the Work unless authorized in writing by the Engineer, or in the Contract Documents.

01520.3.3.5 FILLING OF WATERWAYS - The Engineer will not approve the filling of any ditches, washes, drainage ways, streams, wetlands, or other surface waters by the Contractor to accomplish the Work unless specific instructions are included in the Contract Documents which will provide for how the affected drainages or surface waters are to be treated.

01520.3.4 NOISE ABATEMENT

In or near inhabited areas, particularly residential areas, the Contractor's operations shall be performed in a manner to prevent noise from becoming a nuisance or problem. Particular consideration shall be given to noise generated by repair and service activities during the night hours.

01520.3.5 CHEMICALS

All chemicals and/or petroleum based products used during project construction or furnished for project shall be handled, applied and disposed of in strict accordance with the printed instructions of the manufacturer and regulations enforced by Federal, State and Local health authorities.

01520.3.6 WASTE AND SURPLUS MATERIALS DISPOSAL

01520.3.6.1 CLEAN WORK SITE - The Contractor shall keep the work site, haul roads and other areas of use in a neat, clean condition, free from any accumulation of surplus materials. It shall be the responsibility of the Contractor, at its own expense, to remove and legally dispose of all surplus materials resulting from all Work activities performed in accordance with the Contract Documents.

01520.3.6.2 SURPLUS MATERIAL - Surplus material includes, but is not limited to, salvaged materials and equipment that otherwise would have been abandoned in place, rocks too large to be used as backfill, wood and other organic or unsuitable materials, trash, rubbish, and waste products of any nature, and any other debris generated by the Work.

01520.3.6.3 REGULATORY COMPLIANCE - Disposal of surplus materials shall be accomplished in accordance with all local codes, laws, ordinances, and all applicable safety laws (particularly to the requirements of Part 1926 of the OSHA Safety and Health Standards for Construction) in affect at the approved disposal site. In no case shall it be acceptable for any surplus material to be disposed of in streams, marshes or wetlands.

01520.3.6.4 APPROVAL OF DISPOSAL - The Engineer will not approve any disposal operation, which creates an unsightly and/or unsanitary nuisance. The Contractor shall maintain disposal sites in a reasonable condition of appearance during construction. When designated and/or public disposal sites are unavailable, written approval must be obtained from the Engineer to dispose of any surplus materials on any other site. All disposal sites are subject to approval by the Engineer. The Contractor shall secure permission and all permits required for use of any dumpsite not previously arranged and designated by the Owner. The Contractor shall retain copies, and provide copies upon request, of all disposal permits and/or agreements obtained for the Contract Work.

01520.3.6.5 SCHEDULED REMOVAL - The Contractor shall establish regular intervals of collection and disposal of surplus materials during construction. Stockpiling of surplus materials for later disposal will not be approved or allowed.

01520.3.7 OPEN BURNING

Open burning of materials may be allowed only in strict accordance with all regulations in effect for the area at which the burning would be performed, and the Contractor shall obtain any necessary permits from the appropriate governing entity prior to the start of burning. The Contractor shall not allow fire to spread beyond the material intended for burning. No accumulation of residue from burning shall remain on or adjacent to the construction site, without written approval of the Engineer.

01520.3.8 SANITATION

01520.3.8.1 TOILETS - The Contractor shall provide fixed or portable chemical toilets for employee use in conformance with the requirements of Part 1926 of the OSHA Standards for Construction and when public toilets are not available or within fifteen (15) minutes walking distance of the Work site.

01520.3.8.2 COLLECTION OF WASTES - The Contractor shall be responsible for daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor shall be disposed of away from the site in accordance with all laws and regulations pertaining thereto.

01520.3.9 HAZARDOUS MATERIAL

01520.3.9.1 REGULATORY COMPLIANCE - Disposition of any hazardous material or toxic or hazardous waste shall be made in accordance with the requirements and regulations administered by the State agency wherein the Work site is located.

01520.3.9.2 ABNORMAL CONDITONS - Abnormal conditions include, but are not limited to, the following: buried barrels with liquid or solid contents; buried or above ground tanks with liquid contents; obnoxious odors; excessively hot earth; stained and discolored soils; smoke; unidentifiable powders, sludge, pellets; or any other similar condition.

01520.3.9.3 DISCOVERY AND NOTIFICATION - If any abnormal conditions are encountered during construction, which indicate the presence of a hazardous material, toxic, or hazardous waste, the Contractor shall immediately suspend work in the area of the discovery and notify the Engineer and treat the situation with extreme caution. The Contractor's operation in the area of discovery shall not resume until so directed by the Engineer; however, the Contractor shall continue working in other areas of the project, unless otherwise directed by the Engineer.

01520.3.9.4 DISPOSAL - When it becomes necessary for the Contractor to dispose of discovered materials, the work may be considered a change and administered in accordance with the General Conditions. Should the disposition of discovered waste material require special procedures or handling by certified personnel, the Contractor will make all such arrangements. When it becomes necessary to obtain permits for transporting or handling discovered material, the Owner will obtain the permits.

01520.3.9.5 SPILLS AND NOTIFICATION - In the event of spills of petroleum-based products or hazardous wastes by the Contractor, the Contractor shall immediately notify the Engineer. The Contractor shall also notify the appropriate State environmental enforcement agency, unless the spill consists of less than one (1) gallon of petroleum based products. In no case will notification be made later

than 24 hours after the discovery of the spill. In addition, written notification shall also be made within 5 calendar days of the discovery.

01520.3.9.6 COST OF CLEANUP - All costs for cleanup and disposal of hazardous materials due to spills, inappropriate handling, or negligence of the Contractor shall be borne by the Contractor.

01520.3.10 ENVIRONMENTAL COMPLIANCE

01520.3.10.1 REGULATORY COMPLIANCE - The Contractor shall comply with the applicable requirements of the National Historic Preservation Act as it relates to the preservation of ALL environmental resources. Clearance for protection of environmental resources located within the designated Work site is the responsibility of the Owner and such clearance has been obtained for the Contract, unless provided for otherwise in the Contract Documents.

01520.3.10.2 DISCOVERY OF HISTORIC/ARCHEOLOGICAL OBJECTS – The Contractor shall observe the following:

- DISCOVERY AND NOTIFICATION - If a suspected or unsuspected historic, archeological, or paleontological item, feature, or site is encountered, construction operations shall be immediately stopped in the vicinity of the discovery and the Engineer shall be notified of the nature and exact location of the findings. The Contractor shall not damage the discovered objects and shall provide written confirmation of the discovery to the Engineer within two (2) calendar days.

- RESTRICTION OF CONSTRUCTION - Should operations in the vicinity of a discovery be restricted, the Engineer will keep the Contractor informed concerning the status of the restriction. The Contractor should be aware that the time necessary for the Owner to negotiate the handling of the discovered is variable and is dependent on the nature and condition of the circumstances. It is possible that a delay of as much as three weeks in the vicinity of the discovery can be expected. The Engineer will inform the Contractor when the restriction is terminated. Changes required to accommodate delay or Work resulting from the discovery will be authorized in accordance with the General Conditions.

01520.3.11 OPERATIONS OUTSIDE OF THE PROJECT SITE

In the event the Contractor chooses to use any site or means of obtaining resources beyond those provided as part of the Contract, the Contractor shall retain the services of a qualified, certified environmental consultant to produce a research design or plan for obtaining any and all necessary environmental clearances for such use. The Contractor shall provide the plan to the Engineer for review and approval, as required, following which the plan shall be implemented. The Contractor shall submit evidence of environmental clearances and compliance before commencing any activities within the extended use area. At a minimum, clearances will include those listed below. Additional clearances may be required as necessary.

01520.3.11.1 CULTURAL RESOURCES (Archeological and Historic) - Clearance may require consultation with the State Historic Preservation Office.

01520.3.11.2 THREATENED AND ENDANGERED SPECIES - Compliance may require written clearance from the U.S. Fish and Wildlife Service.

01529.3.11.3 FLOOD PLAINS – May require consultation with the Federal Emergency Management Agency (FEMA) or corresponding state agency.

01520.3.11.4 WETLANDS AND OTHER BODIES OF WATER – May require consultation with the Army Corps of Engineers and/or appropriate state agency.

The Contractor is cautioned that obtaining environmental clearances can be costly and time consuming.

01520.4 METHOD OF MEASUREMENT

Not used.

01520.5 BASIS OF PAYMENT

Not used.

01560.1 DESCRIPTION

Construction staking procedures and responsibilities are broadly defined in the General Conditions and specific information is provided in this Section to define those procedures and responsibilities indicated in the General Conditions.

01560.2 QUALITY CONTROL

All construction staking, whether provided by the Contractor or the Owner, will be supervised by a land surveyor registered in the state in which the Work is located. Surveys will be performed consistent with professional practices and precision generally conducted by surveyors licensed in that state. Complete, legible survey notes will be maintained by the surveyors which show the locations and measurements required to establish construction staking. Such documents shall also provide information to identify the project, location of survey, date of survey, land surveyor's name and registration number. Copies of the Contractor's survey documentation shall be made available to the Owner upon request.

01560.3 OWNER RESPONSIBILITY

01560.3.1 FIELD LOCATION POINTS

Unless otherwise indicated in the Contract Documents, the Owner shall provide information on the Drawings and sufficient surveyed points in the field to locate all features and components of the Contract. Typically, field location points will be established to consist of the following:

01560.3.1.1 PRESSURE LINES - When pressure lines are located in established streets or areas with sufficient referencing features (curb, sidewalks, fence lines, etc.), no staking will be provided and location information shall be provided on the Drawings. When pressure lines are located in areas without sufficient referencing features, stakes will be set to establish the pipe centerline at 100-foot intervals. Where sloping of lines is critical (drain lines, etc.) cut stakes will be provided to indicate flow line elevation at beginning and ends of such lines.

01560.3.1.2 SEWER AND OPEN CHANNEL FLOW LINES AND MANHOLES - Manhole centerline locations will be shown with horizontal offset stakes and cut stakes to indicate the elevation of the flow line. In addition, cut stakes will be set to provide horizontal locations and grade 100-feet upstream on lines flowing into manholes.

01560.3.1.3 TANKS - Circular tank centerline location will be staked and a benchmark (grade) stake will be provided to establish floor top elevation. Exterior corners of rectangular tanks will be staked and a benchmark will be established for establishing floor top. Stakes locating rectangular tank corners will also be provided offset reference stakes.

01560.3.1.4 BUILDINGS AND OTHER STRUCTURES - Two reference points with offset reference stakes will be provided to establish horizontal location of one wall or the centerline. A benchmark (grade) stake will also be provided to establish vertical elevations of the building/structure/s components.

01560.3.1.5 ROADWAYS - In all roadway construction, offset stakes that identify location of the centerline of road will be set at intervals not to exceed 100-feet. When roadway construction requires specific grading, stakes will be set at the beginning points of cuts and fills with offset reference stakes. Hubs will be set to actual finished grades at the top edges of the subgrade and at each consecutive course of surfacing base. Hubs with offset reference stakes will be set on the centerline at the upstream and downstream lip of the flowline of all drainage pipes and structures. Staking intervals for roads with specified grading shall not exceed 100 feet in tangent sections and 50 feet in curved sections. When curbing and/or sidewalks are constructed along roadways, offset stakes with horizontal and vertical

referencing information will be set at intervals of not more than 50 feet. Bench marks for checking and establishing vertical elevations shall be set at intervals not more than 1000 feet apart.

01560.3.1.6 PONDS AND LAGOONS - Offset stakes which identify the centerline and cut/fill stakes with offset reference stakes will be set at intervals of not more than 100 feet as well as at the beginning and end of all curved sections of banks. At least one benchmark shall be provided for each cell of the pond for establishing and verifying vertical elevations.

01560.3.2 COST OF ERRORS

The Owner shall be responsible for the accuracy of any staking, measurements, grades and alignment set by its own surveys. The Owner shall cover costs resulting from staking errors attributable to the Owner's survey.

01560.4 CONTRACTOR RESPONSIBILITY

01560.4.1 ESTABLISHMENT OF GRADES, ETC.

The Contractor shall establish any grades, elevations and distances required for its construction operation from the control staking provided by the Owner and described above. The Contractor shall advise the Owner of anticipated conditions which will affect location of offset stakes and protect the control staking from its construction operation. Where control staking has been damaged or obliterated by the Contractor's operation, replacement of the staking shall be made in accordance with the provisions of the General Conditions.

01560.4.2 ERRORS IN CONSTRUCTION STAKING

When the Contractor observes discrepancies or errors in the control staking, such problems shall immediately be brought to the attention of the Engineer, and the Engineer shall take corrective action as necessary to resolve the problem.

01560.4.3 ACCURACY IN CONTRACTOR SURVEYING

The Contractor shall be responsible for the accuracy of any staking, measurements, grades, and alignments set by its own surveys. Any costs resulting from staking errors attributable to the Contractor shall be borne by the Contractor. The Engineer reserves the discretionary right to check the Contractor's staking, grades and measurements randomly at any time. When such checking is to be exercised, the Engineer will notify the Contractor of the location and the time at which the checking will commence. The Contractor shall then stop any respective part of the Work in progress until the Engineer has notified the Contractor that the checking has been completed and the Work has been found to be in accordance with requirements of the Contract Documents.

01580.1 DESCRIPTION

In general, the Contractor is responsible for providing and maintaining access to the Work, handling and storing of materials and equipment, safety and security within the Work site, and coordination and cooperation with the Owner, its representatives, governing authorities and other contractors working for the Owner in accordance with the provisions of the General Conditions. This section contains specific requirements which apply to these responsibilities.

01580.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 02005 – Traffic Control

01580.1.2 SUBMITTALS

Not used.

01580.1.3 DEFINITIONS

Not used.

01580.2 WORK SITE ACCESS

01580.2.1 INVESTIGATION OF WORK SITE AREA

The Contractor shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting ingress and egress to the site of the work.

01580.2.2 HAUL ROADS

It shall be the Contractor's responsibility to construct and maintain any new haul roads required for its construction operations.

01580.2.3 USE OF PUBLIC STREETS AND ALLEYWAYS

Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of the Work, unless shown otherwise in the Contract Documents.

01580.2.4 CLOSURE OF PUBLIC ROADWAYS

No street, road, or highway shall be closed to the public without first obtaining permission from the proper governmental authorities and the Engineer. Where excavation is being performed in streets or highways, one lane in each direction shall be kept open to traffic at all times, unless otherwise authorized by the Contract Documents or the Engineer. Toe boards, or other measures, may be required by the Engineer to retain excavated material when deemed necessary.

01580.2.5 INTERFERENCE WITH UTILITIES

The Contractor shall so conduct operations as not to interfere unnecessarily with the infrastructure of utility companies or other agencies in such streets, alleyways, or parking areas.

01580.3 PUBLIC SAFETY AND ACCESS

Fire hydrants, approaches to fire stations, police stations and hospitals on or adjacent to the Work shall be kept accessible at all times. Appropriate measures shall be taken by the Contractor, to assure the use of sidewalks, and the proper functioning of all gutters, sewer inlets, water mains, drainage facilities and other infrastructure.

The Contractor's responsibility for Work safety or liability for Work site accidents is not lessened by the presence of the Engineer or his or another inspector performing monitoring of Work site safety conditions.

See also Section 02005 – Traffic Control.

01580.4 CONTRACTOR'S USE OF THE WORK SITE

The Contractor's use of the Work site shall be limited to its construction operations. Written approval by the Engineer will be required for any other use of the site, such as material and equipment storage, personnel vehicle parking, on-site fabrication facilities and field office.

01580.5 OFF-SITE STORAGE

The Contractor shall make arrangements for, bear any use costs associated with, and obtain written permission from the Engineer prior to using any off-site storage or shop areas or facilities determined necessary for execution of the Work. Storage facilities shall be equipped with fences and/or lockable entries that will prevent entry by unauthorized parties. Before off-site storage facilities are placed in use, the Contractor shall provided the Owner keys or combinations to locking devices used to secure the facility.

01580.6 COOPERATION WITH OTHER CONTRACTORS

Prior to authorizing other contractors to work on or adjacent to the Work site, the Owner shall notify the Contractor in writing and provide the name and address of the contractor, the name of its supervisor, a description of the work to be performed, and a schedule which shows the dates and planned segments of the work to be completed by the other contractor. In the event that conflicts or interferences occur between the Contractor and the other contractor's operation, the Engineer shall be notified immediately. The Engineer shall then take appropriate action needed to resolve the problem.

DIVISION 2

SITEWORK

SUNRISE
ENGINEERING

02000.1 DESCRIPTION

This section describes various tasks associated with project execution and close out. Mobilization shall include: preparatory work and materials necessary for obtaining clearances for the Work; moving personnel, equipment, supplies and incidentals to and from the Project Site; quality control; clean-up; temporary utilities and quarters; permits, bonds and insurance; dust abatement, storm water control, and noise abatement; waste and rubbish disposal and control; sanitation; and project close-out operations.

02000.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 01200 - Contract Closeout
Section 01510 - Protection of Existing Property
Section 01520 - Environmental Controls
Section 02005 - Traffic Control

02000.1.2 SUBMITTALS

02000.1.2.1 VISUAL RECORDS - The Contractor shall furnish at least one copy of all visual records, as described below in 02000.3.2, to the Owner.

02000.1.2.2 SERVICE CONNECTION LOCATION AND DOCUMENTATION – When service connections are included in the scope of work the Contractor shall deliver all signed tie-sheets (see 02000.3.3 below) to the Engineer not less than forty-eight hours prior to when the service connection is to be installed.

02000.1.3 DEFINITIONS

Sign - A complete assembly including panel and posts, with fasteners, installed at designated locations.

DVD Record - Photography on DVDs of areas potentially liable for disturbance as a result of the Work required by this Contract.

Service Connection Interview & Documentation - Interviews with potential system users and the documentation of location data for service connections to the respective property from utility lines being installed under this Contract.

Tie Sheets - Forms provided by the Engineer for use in documenting the location of service connection/s of system users.

Service Connection - Piping extending from the main utility line to the property line, or designated connecting point, of any user of the system.

02000.2 MATERIALS

02000.2.1 SIGN PANELS

5/8-inch thick (A or B) exterior grade plywood sheets with best quality exterior enamel paint for face painting and lettering, fastened to posts with at least four 1/2-inch galvanized bolts.

02000.2.2 POSTS

4x4 Cedar or treated Pine commercial fence posts at least eight-feet long or as shown on the Drawings.

02000.2.3 VISUAL RECORD

Records shall be made on professional quality, standard DVD format recording. DVD's shall be provided with protective covers and shall be labeled to indicate the area covered by the photography.

02000.3 CONSTRUCTION REQUIREMENTS

02000.3.1 PROJECT SIGN

The Contractor shall provide project signs, which includes furnishing all materials and labor to fabricate, deliver, install and maintain any and all project identification signs as detailed on Drawings and at location(s) shown thereon.

02000.3.2 VISUAL RECORDS

Prior to any disturbance of the area, the Contractor shall produce a DVD photography of all areas, including but not limited to right-of-ways, streets and roadways, haul-roads and access routes, storage areas, construction sites, and buildings or structures, which will be, or may be, affected by the Work. Such photography will be of a quality to allow accurate determination of location, size, and condition of existing features and improvements taken prior to any occupancy or execution of Work by the Contractor. Additionally, video for each street shall be separated into different chapters, which should each be accessible from the startup menu. Coverage should be taken while the camera is stationary, not from a moving vehicle or other means. DVD's are subject to approval by the engineer and owner. Construction may not begin until the engineer has approved the visual record.

02000.3.3 SERVICE CONNECTION LOCATION AND DOCUMENTATION

Unless called for differently, the Contractor shall contact and interview the owners of all properties indicated on the Drawings and obtain from them sufficient information for location of workable service connections for each property. The Contractor shall document those locations on the tie sheets and obtain a confirmation signature from the connection owner.

02000.4 METHOD OF MEASUREMENT

02000.4.1 MOBILIZATION

Mobilization shall be measured by the lump sum.

02000.4.2 PROJECT SIGN

Measurement for project signs shall be made by counting each sign installed and accepted.

02000.4.3 VISUAL RECORDS

Pre-Construction Photography shall be measured by the lump sum.

02000.4.4 SERVICE CONNECTION DOCUMENTATION

Service Connection Documentation shall be measured by the lump sum.

02000.5 BASIS OF PAYMENT

02000.5.1 The accepted quantity(s) shall be paid for at the contract unit price for:

PAYMENT ITEM	UNIT
Mobilization	Lump Sum
Project Sign	Each
Pre-Construction DVD	Lump Sum
Service Connection Documentation	Lump Sum

02000.5.2 PAYMENT SCHEDULE

The amount bid or identified in a schedule of values for Mobilization shall not exceed 10% of the total contract bid amount. The following payment schedule percentages shall be based on amount bid or identified in a schedule of values for Mobilization up to a maximum of 10% of the total contract bid.

Partial payments for Mobilization will be made in accordance with the payment schedule table below.

MOBILIZATION PAYMENT SCHEDULE

Payment	Amount	When Paid
1ST	25% of mobilization	With first partial payment after 3% of the original contract amount earned by the Contractor.
2ND	25% of mobilization	When amount earned by Contractor is 10% of the original contract price.
3RD	25% of mobilization	When amount earned by Contractor is 50% of the original contract price.
4TH (last)	25% of mobilization	When project is complete and accepted.

02005.1 DESCRIPTION

This section covers furnishing and maintaining all traffic control devices, flaggers and pilot vehicles necessary for protection of the Work, the workers and the traveling public in accordance with these Contract Documents. The requirements of this section are not intended to supersede, but shall supplement, the provisions contained in the "Manual of Uniform Traffic Control Devices" issued by the U.S. Department of Transportation, and any other applicable state or local traffic control regulations.

02005.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 01580 – Work Site Management
Section 02206 – Access Roads and Temporary Use of Roads

02005.1.2 SUBMITTALS

The Contractor, upon request of the Owner or Engineer, shall submit detailed traffic control plans for specific areas of the Work.

02005.1.3 DEFINITIONS

Traffic Control Devices - All temporary traffic control and warning devices required to warn traffic of, and to guide it through, construction areas as required under this Contract, including, but not limited to: portable cones and barricades, signs, channeling devices, paint striping, lighting devices, flags, etc.

Flaggers - Qualified and alert persons equipped with safety warning devices who direct traffic through construction areas.

Traffic Lane - Ten (10) feet of clear street width with a safe motor vehicle speed of twenty-five (25) miles per hour.

Pilot Car - Any designated and properly marked vehicle used for leading groups of vehicular traffic through construction areas.

02005.2 MATERIALS

Not Used.

02005.3 CONSTRUCTION REQUIREMENTS

02005.3.1 COORDINATION OF WORK AND TRAFFIC CONTROL

The Contractor shall endeavor to organize its work force in such a manner as to minimize the closure of public streets and roadways within the Work site. If conditions justify, the Engineer may direct the Contractor to conduct Work in specific areas and/or to specific tasks to avoid closure or interference with traffic on public streets and roadways.

02005.3.2 CLOSURE OF PUBLIC THOROUGHFARES

The Contractor shall not close any public street or roadway without prior approval by the Engineer. When closure is necessary, and approved, the street or roadway shall only be closed to through traffic and not to local traffic. Closure may extend for one city block only, or 700 feet,

whichever is less. Closure of streets and roadways shall be made with barricades meeting State DOT standards. Traffic shall be kept open on streets and roadways where no detour is possible.

02005.3.3 MAINTENANCE OF EXISTING SIGNS

Existing traffic signs other than stop, yield, and street name signs shall be maintained by the Contractor until such time as construction renders them obsolete. At that time the Contractor shall remove signs and posts without damage and deliver them as directed by the Engineer.

02005.3.4 PROTECTION OF WORK AND TRAFFIC

All obstructions and excavations, within traveled streets and roadways, shall be protected with traffic control devices meeting State DOT standards. Traffic control devices, placed within streets and roadways, shall be illuminated at night, and such illumination shall function from sunset to sunrise. Local jurisdiction may require traffic control measures greater than those of State DOT standards, in which case the Contractor shall comply with such requirements.

Whenever the Engineer finds traffic control conditions at the Work site to be inadequate to assure public safety, or the Contractor's protective facilities to be inadequate, the Engineer may require the Contractor to provide the additional necessary facilities or services. The Contractor shall bear the cost of the additional protection.

See also Subsection 01580.3.

02005.4 METHOD OF MEASUREMENT

02005.4.1 TRAFFIC CONTROL AS LUMP SUM

If traffic control appears as a separate item in the Bid Schedule, it shall be measured as a lump sum item. Therefore, with the possible exception of the items mentioned in the following two paragraphs, no separate measurement will be made for furnishing and maintaining traffic control devices, personnel, or any vehicles or other equipment used for traffic control.

02005.4.2 FLAGGING

When flagging is listed separately in the Bid Schedule, the work of flag persons will be measured by counting the number of hours put in by each separate flag person. This measurement shall include the time and/or mileage for any vehicle or other equipment required for performing the flagging work.

02005.4.3 PILOT VEHICLE

When a requirement for the use of pilot vehicles is called for separately in the Bid Schedule, that use will be measured by counting the number of hours each separate vehicle is in actual operation piloting or otherwise directing traffic.

02005.5 BASIS OF PAYMENT

02005.5.1 Unless provided for in the Contract Documents, the cost of all traffic control, including flagman, barricades, pilot cars and other devices, shall be included in the Contract Price and no separate measurement and payment will be provided.

02005.5.2 When provided in the Bid Schedule, the generally accepted quantities for traffic control shall be:

PAYMENT ITEM	UNIT
Traffic Control	Lump Sum
Flaggers	Hours
Pilot Vehicles	Hours

02015.1 DESCRIPTION

This section covers the removal of vegetation, debris, and other obstacles from the defined rights-of-way and limits of the project area and/or construction work site.

02015.1.2 RELATED WORK

Section 01510 - Protection of Existing Properties
Section 02200 - Trench Excavation and Backfill
Section 02500 - Removal and Replacement of Surface Improvements
Section 02900 - Landscaping

02015.1.3 DEFINITIONS

Clearing - consists of removal and disposal of trees, stumps, logs, limbs, sticks, vegetation, rubbish, debris and other material on the natural ground surface.

Grubbing - consists of removing and disposing of roots (one-inch and larger diameter), tree stumps, buried logs, debris, and other underground obstructions.

02015.2 MATERIALS

Not used

02015.3 CONSTRUCTION REQUIREMENTS

Clear, grub, remove and dispose of all trees, vegetation and debris within the staked limits of the roadways, trenches, channels, easements, embankments, structures, and other designated areas. Do not injure or damage trees, shrubs, or other vegetation and objects to remain intact as designated by the Engineer or the Owner. Such items are to be fully protected from injury at the Contractor's expense.

02015.3.1 CLEARING

Areas within the limits of excavation and embankment slope stakes shall be cleared.

Tree branches extending over the area to be cleared and which hang within 12 feet of the ground surface shall be cut off in a neat and workmanlike manner. When such branch removal is necessary, the Contractor shall remove other adjacent branches on the tree under the direction of the Engineer so as to present a balanced appearance. Scars resulting from the removal of branches shall be treated with a heavy coat of approved tree sealant.

02015.3.2 GRUBBING

Grub all areas within the limits described as follows:

02015.3.2.1 FOR CONSTRUCTION OF ROADWAYS - Grub the area between the limits of the excavation and embankment slope stakes to a depth of two (2) feet below natural ground level to remove all stumps, roots, buried logs and other underground debris. However, when the roadway embankment already is two feet or more above the natural ground level, stumps cut less than 6 inches above natural ground, together with roots and other non-perishable obstructions, may remain in place.

02015.3.2.2 FOR CONSTRUCTION OF PONDS OR LAGOONS AND STRUCTURES - completely grub the pond area within the boundaries of the dikes or structures to a depth of two (2) feet and remove all

stumps, roots, buried logs and other underground debris. Grubbing of this area shall include removal of the top 6-inches of organic laden topsoil and stockpiling it for later distribution over areas shown in the Contract Documents or directed by the Engineer.

02015.3.3 BACKFILLING

All stump holes, cuts, depressions and other holes resulting from clearing and grubbing operations within areas designated to receive pipelines, structures, or embankments shall be backfilled and compacted to the density of the surrounding ground.

02015.3.4 DISPOSAL

The Contractor shall dispose of all materials resulting from clearing and grubbing operations as required in the Contract Documents and in accordance with Section 01520 of these Specifications.

02015.3.5 MARKERS, MONUMENTS AND DATA POINTS

Land monuments, property markers or official datum points shall be protected until their removal is approved. When movement of monuments or markers is deemed necessary and approved by the Engineer, all such monuments or markers shall be carefully referenced for re-establishment before removing.

02015.4 METHOD OF MEASUREMENT

02015.4.1 SEPARATE PAYMENT

Measurement for "Clear and Grub" shall be made either as lump sum or by counting the number of acres. to the nearest tenth (10^{th}), of area actually cleared and grubbed within the limits shown on the Drawings or as directed and approved by the Engineer. For areas where ponds or lagoons are to be constructed, this measurement shall include the removal and stockpiling of the first six (6) inches of topsoil in addition to grubbing to the required depths.

02015.4.2 NO MEASUREMENT

02015.4.2.1 NO PAY ITEM FOR CLEAR & GRUB - When the Bid Schedule does not contain a pay item for "Clear and Grub", then that work will be considered incidental to other Work items which require clearing and grubbing and no separate measurement shall be made.

02015.4.2.2 ROADWAY EXCAVATION and/or BORROW - Material used for filling depressions will be measured separately only when "Roadway Excavation" and/or "Borrow" appear as separate pay items on the Bid Schedule. Measurement will be made by counting the number of cubic yards of material moved and placed as designated on the Drawings or as directed and approved by the Engineer. If "Roadway Excavation" or "Borrow" are not included in the Bid Schedule, material used for filling depressions will not be measured separately, but will be considered incidental to the Work.

02015.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price.

PAYMENT ITEM	UNIT
Clear and Grub	Lump Sum
Clear and Grub	10^{th} of Acre

Replace the following sections as follows:

02015.3 CONSTRUCTION REQUIREMENTS

02015.3.2.2 FOR AREA AROUND SPRING - completely grub the area around the spring box as shown on the DRAWINGS. Remove all moss, branches, stumps, roots, buried logs and other underground debris on and around the spring box. The spring box and piping shall not be damaged. Minimize disturbance to the creek bed and vegetation along the stream bank with equipment.

02015.3.3 BACKFILLING

All stump holes, cuts, depressions and other holes resulting from clearing and grubbing operations within areas designated to receive pipelines, structures, or embankments shall be backfilled and compacted to the density of the surrounding ground including the area designated for clearing and grubbing around the spring as shown in the DRAWINGS.

SUBSURFACE INVESTIGATION — SECTION 02020

02020.1 DESCRIPTION

Furnish and provide labor and equipment for investigation of existing miscellaneous pipelines, wires or cables, and other miscellaneous sub-surface features as required by the Engineer.

02020.1.1 RELATED WORK

Section 01510 - Protection of Existing Improvements

02020.1.2 SUBMITTALS

Not used.

02020.1.3 DEFINITIIONS

Not used.

02020.2 MATERIALS

The Contractor shall provide a backhoe and qualified operator; laborer with hand shovel: appropriate fuel and lubricants, necessary equipment servicing materials; and appropriate equipment for transporting the backhoe to perform the investigation. The backhoe shall be a rubber tired CASE 580 backhoe, or an approved unit of equivalent or greater size and capacity, having accumulated not more than 5,000 hours operating time.

02020.3 CONSTRUCTION REQUIREMENTS

02020.3.1 EXPOSURE BY EXCAVATION

When directed by the Engineer, the Contractor shall excavate and expose miscellaneous pipelines, structural features, soil materials and other underground features which may be present at the work site. The location and extent of exposure shall be determined on site by the Engineer. Designation of such areas shall be made in writing, usually in the form of a Work Order, by the Engineer.

02020.3.2 REPLACEMENT OF EXCAVATED MATERIALS

Work required hereunder shall include replacement of excavated materials sufficiently to restore the site to a safe condition as determined by the Engineer. Full restoration of materials such as pavement, concrete slabwork, sod, etc., in the investigated area will be accomplished in accordance with the Contract Documents and as directed by the Engineer.

02020.4 METHOD OF MEASUREMENT

02020.4.1 MEASUREMENT BY HOURS OF WORK

Measurement of subsurface investigation shall be made by counting the actual number of hours of work completed by the machine and operator to investigate miscellaneous underground features as required by the Engineer. No allowance of time will be made for transporting the backhoe to and from the job site when the backhoe is located on the site of the Contract.

02020.4.2 MEASUREMENT FOR OTHER ITEMS OF WORK

When restoration of the excavated area requires provision of pavement, concrete slabwork, sod, etc., separate measurement will be made for those materials in accordance with the respective requirement(s) for measurement of that item in the Contract Documents.

02020.5 BASIS OF PAYMENT

The accepted quantity of work will be paid for at the contract unit price of:

PAYMENT ITEM	UNIT
Subsurface Investigation	Hour

When provision of designated materials is required for restoration of the excavation, payment for such materials shall be made in accordance with the respective provisions of the Contract documents.

02105.1 DESCRIPTION

This section covers obtaining permission, permits, clearances, etc.; as necessary to develop source(s), purchasing or manufacturing, loading, hauling, placing and compacting earthwork materials described herein, as shown on the Drawings and/or required by these Specifications.

02105.1.1 RELATED WORK

Section 02200 - Trench Excavation and Backfill

02105.1.2 SUBMITTALS

When the Bid Schedule indicates quantities of materials described in this section in excess of 50 cubic yards or 50 tons, or when requested otherwise by the Engineer, the Contractor shall provide test results from a certified independent laboratory which has sampled and performed the prescribed test(s) for those materials.

02105.1.3 DEFINITIONS

Granular Material - Material for which the sum of plasticity index (AASHTO T-90) and the percent of material passing a No. 200 sieve (AASHTO T-27) shall not exceed 23.

Silt - Material which passes the No. 200 (AASHTO T-11) sieve and has a plasticity index not greater than 10.

Clay - Material which passes the No. 200 sieve and has a plasticity index greater than 10.

Bedding - Materials placed immediately around and adjacent to pipe installed in trenches.

Borrow - Material obtained from a source away from the site on which installed and/or excavated and used to supplement insufficient quantities of material required.

02105.2 MATERIALS

02105.2.1 ON-SITE TRENCH OR STRUCTURAL BACKFILL

On-site trench or structural backfill consists of material excavated during trenching or foundation excavation which is free of cinders, ashes, wood, vegetation, frozen or other deleterious material or rocks with a maximum particle size not greater than 6-inches. Material may be required to be processed or transported along the excavation.

02105.2.2 IMPORTED TRENCH OR STRUCTURAL BACKFILL

Imported trench or structural backfill consists of granular material obtained from sources indicated on the Drawings, designated in the Special Provisions or approved by the Engineer. Borrow materials shall be free of cinders, ashes, wood, vegetative matter, frozen or other deleterious matter with a maximum particle size not greater than 6-inches. Pit Run Borrow may be used as backfill in trenches, excavations for structures, in roadway subgrades, or as otherwise shown on the plans or called for by the Engineer. Material may be processed or may be pit run.

02105.2.3 ON-SITE PIPE BEDDING

On-site pipe bedding consists of material excavated during the trenching operation which is free of cinders, ashes, wood, vegetation, frozen or other deleterious material or rocks with a maximum

particle size not greater than that shown below in Table 1. Material may be required to be processed or transported along the trenching operation.

02105.2.4 IMPORTED PIPE BEDDING

Imported pipe bedding consists of granular material excavated from an approved borrow source which is free of cinders, ashes, wood, vegetation, frozen or other deleterious material or rocks with a maximum particle size not greater than that shown in Table 1 below. Material may be processed or may be pit run.

Table 1 - MAXIMUM PARTICLE SIZE FOR PIPE BEDDING

Pipe	Size
Corrugated Metal and Welded Steel	1”
Polyethylene, Galvanized Steel and PVC	3/4” in Utah or 1”in other states
Ductile Iron, Cast Iron, Concrete, and HDPE	2”

02105.2.5 SAND

Sand shall be graded granular material which passes a 3/8-inch sieve, with not more than 10 percent passing the No. 200 sieve (AASHTO T-27) and free from cinders, ashes, wood, vegetation, frozen or other deleterious material.

02105.2.6 UNTREATED BASE COURSE

Untreated base course consists of processed natural gravel and crushed rock with an approved soil binder without any deleterious materials, tested in accordance with AASHTO T-27 and T-11 which meets the gradation requirements in Table 2 below.

Table 2 - PARTICLE SIZE FOR UNTREATED BASE COURSE

Sieve Size	Percent Passing
1-inch	100
½-inch	70-90
#4	40-60
#16	20-40
#200	5-12

02105.2.7 BITUMINOUS SURFACING

Plant mix bituminous material, with maximum particle size not greater than 3/4-inch, meeting the requirements of Section 02511 of these Specifications.

02105.2.8 DRAIN GRAVEL

Drain gravel consists of washed natural gravel or crushed rock, with a maximum particle size of 1-inch, with not more than 40 percent passing the No. 4 sieve, with 100 percent being retained on the No. 10 sieve, and without any deleterious material.

02105.2.9 RIPRAP

Riprap consists of durable, angular, sound and hard field or quarry stones free from cracks and structural defects. Source of supply shall be approved by the Engineer. Fifty percent of the stones shall be of sizes between one-half and two-thirds of the riprap layer thickness shown on the Drawings. Not more then 10-percent of the stones by weight shall be of a size less than one-tenth

of the riprap layer thickness shown on the Drawings and the specific gravity of the stones must range between 2.5 and 2.82 (AASHTO T-85). Durability of the stones shall be in excess of 40 percent (AASHTO T-210).

02105.2.10 SUBGRADE GRANULAR FILL

Subgrade granular fill consists of well graded granular soils with a maximum of 50 percent passing the No. 4 sieve and a maximum of 20 percent passing the No. 200 sieve and no materials greater than 4-inches in diameter.

02105.3 CONSTRUCTION REQUIREMENTS

02105.3.1 LOCAL GOVERNMENT SPECIFICATIONS

Differences may exist between the requirements of these Specifications for sitework materials such as backfill, bedding, untreated base course and bituminous surface course, and those of local government entities. Such differences may affect Contract prices; therefore, when Contract Work falls within the boundaries of any local government, the Contractor shall make himself aware of that entity's specifications for those materials. If differences exist between those specifications and these, unless otherwise approved by the Engineer, the more stringent ones shall apply.

02105.3.2 BORROW AND DISPOSAL SITES

The Contractor shall, at its own expense, secure all necessary access and borrow sites for acquisition or removal and to dispose of excess backfill or waste materials, unless otherwise shown on the Drawings.

02105.3.3 ON-SITE MATERIALS

Unless otherwise shown on the Drawings or directed by the Engineer, on-site pipe bedding and trench backfill will be used for installation of all pipe. In areas where suitable on-site material is not available, other material, which meets these Specifications, will be used when shown on the Drawings, provided for in these Contract Documents or approved by the Engineer.

02105.3.4 SCALES

When ton weight is to be used to determine quantities of earthwork materials used, the Contractor shall provide his own scales or access to other scales at his own cost. Scales shall be certified accurate. Include certification in submittals.

02105.4 METHOD OF MEASUREMENT

02105.4.1 NO MEASUREMENT

On-Site Pipe Bedding and On-site Trench or Structural Backfill will be considered part of the items for piping or excavation associated with structures included in the Bid Schedule and no separate measurement for these materials will be made.

02105.4.2 SEPARATE MEASUREMENT

02105.4.2.1 IMPORTED MATERIALS – Quantities of imported pipe bedding and imported trench or structural backfill shall be determined by measuring the lineal feet (lineal feet of trench requiring imported materials) of imported material in place and accepted. This measurement shall include furnishing all necessary materials and equipment, labor, hauling, placement, compaction, and testing to produce an acceptable trench fill.

No allowance will be made for bedding and backfill materials required to fill voids caused by trenching operations, which exceed the dimensions shown on the Drawings.

02105.4.2.2 SAND – Quantities of sand shall be determined in cubic yards in place, calculated by multiplying the measured length of trench by the measured depth of bedding by the pay width shown on the Drawings, or as directed by the Engineer in the field.

No allowance will be made for materials required to fill voids caused by trenching operations, which exceed the dimensions shown on the Drawings.

02105.4.2.3 UNTREATED BASE COURSE - Quantities of untreated base course shall be determined in cubic yards in place, calculated by multiplying the measured length by neat line dimension shown on the drawings. If no neat lines are shown on the drawings, then the cubic yard calculations shall be determined by actual measurements in the field in place.

02105.4.2.4 BITUMINOUS SURFACING – Quantities of the respective compacted thickness of bituminous surfacing shall be determined in square yards by multiplying the length of material in place and accepted by the pay width shown on the Drawings, or as directed by the Engineer in the field.

02105.4.2.5 DRAIN GRAVEL - Quantities of drain gravel shall be determined in cubic yards calculated by multiplying the measured length by the measured depth of bedding in place by the pay width shown on the Drawings, or as directed by the Engineer in the field.

02105.4.2.6 RIPRAP - Quantities of riprap shall be determined in cubic yards by multiplying the measured length by the measured breadth by the measured average depth of material in place and accepted.

02105.4.2.7 SUBGRADE GRANULAR FILL - Quantities of subgrade granular fill shall be determined in cubic yards by multiplying the measured length by the measured breadth by the measured depth of material in place and accepted.

02105.5 BASIS OF PAYMENT

The accepted quantity shall be paid for at the contract unit price for:

PAYMENT ITEM	UNIT
Imported Trench or Structural Backfill	Lineal Foot
Imported Pipe Bedding	Lineal Foot
Sand	Cubic Yard
Untreated Base Course	Cubic Yard
Bituminous Surfacing (Thickness)	Square Yard
Drain Gravel	Cubic Yard
Riprap	Cubic Yard
Subgrade Granular Fill	Cubic Yard

02200.1 DESCRIPTION

This section covers furnishing of equipment, labor, and materials to clear, excavate, backfill and compact trenches for utilities. Excavation and backfill for piping appurtenances such as manholes, inlets, transition structures, junction structures, vaults, thrust blocks, valve boxes, catch basins, etc., shall be included, as also shall be restoration of the disturbed ground surface in accordance with the Contract Documents.

02200.1.1 RELATED WORK

Section 02005 – Traffic Control
Section 01510 - Protection of Existing Properties
Section 02015 - Clearing and Grubbing
Section 02105 - Earthwork Materials
Section 02208 - Flowable Backfill
Section 02222 - Water Pipe Installation
Section 02224 - Sewer Pipe and Manhole Installation
Section 02315 - Boring and Jacking
Section 02320 - Pipe Encasement
Section 02500 - Removal and Replacement of Surface Improvements
Section 02900 – Landscaping
Section 02204 – Water for Construction

02200.1.2 SUBMITTALS

02200.1.2.1 MOISTURE DENSITY TESTING AND GRADATION DETERMINATIONS - A documentation system shall be maintained by the Contractor to record results from all moisture/density testing and gradation determinations. Records of these tests shall show the following information as a minimum:

- Date of test.
- Type of test.
- Name of person performing test.
- Location of sample taken.
- Results of test and comparison with specified value required for compliance.

Upon completion of each gradation test or moisture/density test, a copy of the record for the respective test shall be delivered to the Engineer within one (1) working day following the completion.

02200.1.2.2 COMPLIANCE TESTING - Documentation shall also be made, in field diaries, of all compliance tests performed by the Contractor. Documentation shall be made available to the Engineer upon request.

02200.1.3 DEFINITIONS

Trench Width - Shall not be more than 18 inches greater than the outside diameter of the pipe being installed at a point 12 inches above the top of the pipe unless otherwise shown on the Drawings. The width of the trench above that level shall be the minimum width required for safe working conditions, sheeting, bracing and for proper installation of the work.

Trench Grade - The vertical elevation of the flowline of the pipe being installed in the trench.

Open Trench - Shall include trench sections which have been excavated and are awaiting completion of pipe installation, backfill, compaction or installation of a temporary surface.

Surface Restoration - Shall include the Work required to restore the ground surface disturbed for trench excavation. Replacement of road surfacing, planting and landscaping removed for trench excavation, will not be considered as trench excavation and backfilling.

Consolidated Backfill - A condition of backfilling for which a specified compaction density is required. Maximum lift, prior to compaction, for consolidated backfill shall be 8 inches unless otherwise approved by the Engineer.

Unconsolidated Backfill - A condition of backfilling for which no compaction density is specified and the required compaction effort is layer placing and then compacting by wheel rolling or use of compacting equipment. Lifts of up to 24 inches are allowed for unconsolidated backfill.

Unclassified Excavation - A determination for excavating whereby no consideration will be given to different kinds of materials that are encountered.

02200.2 MATERIALS

Not used.

02200.3 CONSTRUCTION REQUIREMENTS

02200.3.1 PERMITS

For work which is to take place within state and/or federal road and highway rights-of-way, the Contractor shall be responsible for obtaining all required encroachment and construction permits prior to beginning any work within the rights-of-way.

All work in any city, town or county public right-of-way will also require an approved excavation permit from that entity. The Contractor shall be responsible for obtaining all required encroachment and construction permits prior to beginning any work within the rights-of-way.

02200.3.2 CLEARING AND GRUBBING

On areas outside of established roadways, the area to be disturbed by the trenching operation shall be cleared and grubbed in accordance with Section 02015 prior to beginning the trenching operation.

02200.3.3 EXCAVATION

02200.3.3.1 UNCLASSIFIED EXCAVATION - All excavation for this project shall be unclassified excavation, unless otherwise determined by the Engineer.

02200.3.3.2 STAKING - Location staking of piping will be provided by the Owner in accordance with the provisions of Section 1560 unless indicated otherwise in the Contract Documents.

02200.3.3.3 EXPOSURE OF UNDERGROUND FEATURES - Before any trench excavation is started, the Contractor shall locate and expose all existing underground utilities, structures, etc., which may interfere with, or conflict with, the trench being excavated. In case of conflicts, the Contractor shall make adjustments in the location of the excavation at the direction of the Engineer. Such adjustments shall be made at no additional cost to the Owner.

02200.3.3.4 The Contractor shall perform all excavation to the depth specified in the Drawings and/or as required to accomplish the Work. During the excavation operations, excavated materials which are suitable for use as backfill for trenches or around structures, shall be piled separately at sufficient distance from the edge of the excavation to be out of the way of equipment and to

prevent slides and cave-ins from embankment overloading. All excavated materials not suitable for, or not required for, fill or backfill shall be separated and removed promptly from the site of the Work and disposed in an approved site in accordance with Section 1520.

02200.3.3.5 PUBLIC TRAVEL - Materials excavated within roadways, regardless of their disposition, shall be piled in such manner that will cause the minimum of inconvenience to public travel and always allow for emergency vehicle passage.

02200.3.3.6 OPEN TRENCH - At no time shall the Contractor allow more than 500 cumulative feet of trench to be open for the overall project, unless otherwise approved by the Engineer.

02200.3.3.7 SHORING - Shoring and/or trench boxes shall be used wherever needed to protect workers and adjacent structures and property of the Work in accordance with OSHA requirements. The arrangement of bracing of shoring shall not be set so as to stress any portion of completed work.

02200.3.3.8 BARRICADING OPEN WORK - Excavations left open at the end of the work day shall be surrounded by barricades and warning tape.

02200.3.4 EXCAVATION IN ROCK

02200.3.4.1 SOLID ROCK EXCAVATION

Solid rock excavation will receive special consideration IF the following applies:

- The Contract Documents contain measurement and payment provisions for "Solid Rock Excavation", and
- Solid rock excavation is not included in another bid item, and
- Solid rock has been encountered in the excavation, and
- The Contractor has made ample (as determined by the Engineer) attempts to remove the rock using an excavator weighing not less than 74,000 lbs, such as a Cat 330B; then the excavation of such material will be considered as "solid rock excavation". As a general rule, if the specified excavator using a 30" bucket with rock teeth, requires more than two minutes to remove one (1) full bucket of material, the material is considered solid rock.

If the Contractor encounters solid rock (as described above) at a thickness greater than 12 inches, then the entire trench is considered "Solid Rock" and the Contractor will be reimbursed as outlined in the Measurement and Payment sections.

02200.3.4.2 BLASTING - When blasting is deemed necessary for rock removal, the Contractor shall comply with all applicable State and Local laws, ordinances, and provisions for blasting safety and obtain written approval from the Engineer prior to starting of drilling and/or blasting operations.

In all cases, blasting shall be performed by experienced, qualified blasters. The Contractor is responsible for any and all damage caused by blasting, and blasting will not be allowed within 15 feet of any existing structures.

If for any reason, the Contractor chooses to blast any portion, it is understood that the blasting areas chosen by the Contractor are not necessarily considered "Solid Rock" until the trench is open and visually inspected by the Engineer, at which time a determination will be made to consider it "Solid Rock".

02200.3.5 OVER-EXCAVATION

02200.3.5.1 UNAUTHORIZED OVER-EXCAVATION - Care shall be taken to not excavate below the depth required by the Drawings. Any unauthorized over-excavation shall be refilled and compacted with material meeting the requirements of Section 02105 and approved for use by the Engineer at the expense of Contractor.

02200.3.5.2 ROCK - Whenever rock is encountered in the trench bottom, the trench shall be over-excavated a minimum of 6 inches below the design elevation of the bottom. of the pipe. The over-excavated portion of the trench shall be filled with approved bedding material and the bedding compacted, all at the expense of the Contractor, unless otherwise approved by the Engineer and the Owner.

02200.3.5.3 UNSTABLE NATIVE FORMATIONS - The Contractor shall notify the Engineer if soft, spongy, or otherwise unstable native formations, that are not suitable for structure or pipeline foundations, are encountered in excavations. In the event the Engineer determines that the existing foundation materials are unacceptable, the Contractor will be directed to over-excavate, remove and replace the unsuitable soil materials. The over-excavation shall be backfilled with approved select materials and compacted in accordance with the requirements described herein. Such situation will be considered as a changed condition and the Contractor will be compensated in accordance with the General Conditions.

02200.3.6 PIPELINE ACCESSORY INSTALLATION

02200.3.6.1 EXCAVATION FOR ACCESSORIES - The Contractor may excavate to place the sides of manholes, vaults, valve boxes, inlet structures, catch basins or other accessory structures directly against the excavated surface, provided that the faces of the excavation are firm and unyielding and are at all points outside the structure lines shown on the plans. If the native material is such that it will not stand without sloughing, the Contractor shall over-excavate to place the structure and this over-excavation shall be backfilled and compacted, using the same material required for the adjoining pipeline trench.

02200.3.6.2 ACCESSORY SUPPORT - To prevent displacement of valve boxes and other accessory structures, trench backfill shall be compacted to at least 95% of maximum density as determined by AASHTO T-99 for 6 feet along the trench on each side of the box or structure.

02200.3.7 TRENCH BOTTOM PREPARATION

The bottom of the trench shall be accurately graded to provide uniform bearing and support for each section of the pipe. Bell or coupling holes shall be made in accordance with the recommendations of the pipe manufacturer after the trench bottom has been graded. Such depressions shall be of sufficient width to provide clearance for connecting and/or bolting. Holes for depressions shall be excavated only as necessary to permit proper joining of pipe sections.

02200.3.8 SURFACE IMPROVEMENTS

When surface improvements must be removed, or are damaged or disturbed by the Work, their removal and restoration shall be accomplished by the Contractor in accordance with Sections 01510 and 02500 of these Specifications.

02200.3.9 PROTECTION OF EXISTING UTILITIES

The Contractor shall protect all existing utilities, either above or below ground, in accordance with the provisions of Section 01510 of these Specifications.

02200.3.10 IRRIGATION DITCHES, PIPES AND STRUCTURES

The Contractor shall contact the owners of all irrigation facilities to be encountered by the work and make arrangements for construction clearances and/or facility shutdown schedules. All irrigation ditches, dikes, headgates, pipe, valves, culverts, etc., damaged or removed by the Contractor shall be restored by the Contractor to their original condition, or better, in accordance with Section 02500 of these Specifications, at no additional cost to the Owner.

02200.3.11 BUILDING FOUNDATIONS AND STRUCTURES

Where trenches are located adjacent to building foundations and structures, the Contractor shall take all necessary precaution against damage to such facilities. Water settling of backfill material in trenches adjacent to structures will not be permitted unless authorized in writing by the Engineer. The Contractor shall be liable for any damage caused by the construction, and shall restore or replace damaged property in accordance with Section 02500 of these Specifications.

02200.3.11.1 SIDEWALK, CURB AND GUTTER - Where sidewalk, curb, and gutter exist, excavation may be made by tunneling provided the following requirements are met. Excavation shall be vertical and as near to the curb or sidewalk as possible. The length of the tunnel shall not exceed the width of the sidewalk, curb and gutter. Where a separate sidewalk and curb exist, an excavation shall be made between the sidewalk and the curb. At least three feet of undisturbed earth shall be left under the sidewalk. Where the excavation does not meet these requirements, a section of sidewalk from joint to joint shall be removed and replaced.

Gas Lines and Water Lines may be jacked, augured or jetted under sidewalk, curb and gutter provided the resulting hole diameter does not exceed one (1) inch plus the outside diameter of the pipe installed.

Backfill of Sidewalk Tunnels. Where the sidewalk has been tunneled, the hole shall be filled from each end with earth compacted with mechanical tampers to 90% of AASHTO T-180, Method C. A 3'-0" section of trench on each side of the tunnel and any space between the sidewalk and curb shall be backfilled with mechanically compacted earth as specified.

02200.3.12 WATER

02200.3.12.1 WATER FLOW - The Contractor's operation shall always ensure the free flow of water in gutters, culverts, and natural watercourses. In irrigated land areas, excavated materials shall be piled on the downhill sides of trenches.

02200.3.12.2 GROUNDWATER – Unless provided with geotechnical information by the Owner, the Contractor shall have the responsibility of determining the presence and location of groundwater at the work site.

02200.3.12.3 DEWATERING - Grading and other protective measures shall be performed as necessary to prevent surface or ground water from flowing into trenches or other excavations. Any water accumulated therein during construction, from surface or from underground sources, shall be promptly removed by pumping or by other approved methods at the Contractor’s expense.

Unless given as a separate item in the Bid Schedule, dewatering shall be performed at the expense of the Contractor. When geotechnical information is given, groundwater must be in excess of ± 2 feet before a change in work will be considered.

02200.3.12.4 INSTALLATION IN WATER - No backfill, subgrade materials, concrete or masonry footings, foundations, floors, equipment, or pipe shall be placed or laid in water. Water shall not be allowed to rise over such work for at least 24 hours following the pour or placement of any concrete or

mortar used in the work. Water shall not be allowed to rise unequally against structure walls for a period of 14 days following concrete placement or masonry erection.

Groundwater or surface water in piping trenches shall not be allowed to enter and flow through the piping while installation of pipe is in progress.

02200.3.12.5 DISPOSAL - The Contractor shall dispose of all water from the work in a suitable manner without damage to adjacent property

02200.3.13 BEDDING AND PIPELINES

02200.3.13.1 USE OF ON-SITE MATERIALS - Unless directed otherwise in these Specifications, on-site materials complying with Section 02105 shall be used for bedding. If an act, or failure to act on the part of the Contractor creates a need to use imported bedding materials, the Contractor shall bear the cost of all additional excavation, transportation and installation for new bedding, and for removal and disposal of unacceptable materials, as required to correct that situation.

02200.3.13.2 INSUFFICIENT ON-SITE MATERIALS - When sufficient bedding material cannot be developed from on-site materials, and no provision is contained in the Contract Documents for importing bedding materials, the Engineer shall be notified as soon as possible. Alternative measures will be considered and a change can then be negotiated to provide additional materials in accordance with the General Conditions.

02200.3.13.3 BEDDING INSTALLATION - Pipe bedding shall be installed according to applicable sections of these Specifications for pipeline construction.

02200.3.14 BACKFILL

02200.3.14.1 BACKFILL MATERIALS AND PLACEMENT - Backfill shall be accomplished using acceptable materials as described in Section 02105 as follows:

- All backfill materials shall be at ± 2% of optimum moisture content when placed in the trench or other excavation.
- Unless provided otherwise on the Drawings, consolidated trench backfill shall be placed in lifts not greater than 8 inches.
- Unsuitable excavated material, or material with incorrect moisture content shall be removed and replaced.
- Soft spongy material that causes areas which “pump” when heavy loads pass over them, shall be removed and replaced with suitable material.
- Dry material that will not “ball” shall be removed and replaced.

  (The two foregoing conditions shall be considered sufficient evidence, without further testing, that the moisture content is incorrect and shall be grounds for removal and replacement of the material. Such replacement, if required, shall be at the sole expense of the Contractor.)

- Placement of backfill against cast-in-place concrete structures shall not be started until the concrete has been cured for the time required by the Contract Documents or prescribed by the Engineer.

02200.3.14.2 COMPACTION – Compaction procedures shall be as follows:

- The Contractor shall be responsible for obtaining construction water needed for compaction in accordance with Section 02204 of these Specifications.

- Bedding and consolidated backfill material shall be compacted with tamping, vibrating or conventional wheeled compaction equipment. Use care not to damage pipe while compacting bedding materials.
- The use of wheel rolling for compaction shall only be approved for compacting unconsolidated backfill materials.
- For work within state or federal highway rights-of-way, compaction shall meet the requirements of the respective applicable specifications.
- Backfill shall be thoroughly compacted to densities not less than those shown in the following table:

TABLE OF MINIMUM DENSITY REQUIREMENTS
(based on AASHTO-99 and T-91 and on ASTM D-2922 and E-3017)

Location	From Surface to 2-Feet Below Surface	From 2-Feet Below Surface to Top of Bedding	Bedding
Within 6 feet of, and/or under, any existing or proposed structure, pavement, curb, sidewalk, roadway or similar construction included in the Contract:	100% for granular and 95% for non-granular materials	95% for all materials	95% at all locations
Around any structure outside 6 feet:	90% for all materials	90% for all materials	90% at all locations
Cultivated and landscaped areas:	85% for all materials	85% for all materials	85% at all locations
Undeveloped Land:	Unconsolidated – see definition	Unconsolidated - see definition	85% at all locations

02200.3.15 SETTLING AND SUBSIDENCE

Dips or uneven surfaces caused by subsidence or post-construction settlement of fill or backfill in any trenches, excavations, fills, or embankments within the work, which become apparent within the warranty period, shall be repaired by the Contractor at no additional cost to the Owner.

02200.3.16 SAMPLING AND TESTING

02200.3.16.1 TESTING BY INDEPENDENT LABORATORY - As directed by the Engineer, the Contractor shall provide for all sampling and testing through a qualified, independent testing laboratory at the Contractor's own expense.

02200.3.16.2 SCHEDULE OF SAMPLING AND TESTING - The following schedule of sampling and testing provides minimum requirements, to assure compliance with all materials and compaction requirements described herein. The number of samples and tests shown shall be considered minimum, and field conditions may necessitate additional sampling and testing to be required by the Engineer.

GRADATION DETERMINATION (AASHTO T-27 and T-11)

Trench Location	Testing Required
Materials imported or manufactured at a site determined by this contract	One test per site or source

On-site excavated materials along trenches.	One test per geographical area where material composition and gradation visually appears consistent.

MOISTURE/DENSITY RELATIONSHIP (Proctor)
(AASHTO T-99 or T-180 Method D)

Trench Location	Testing Required
Materials imported or manufactured at a site determined by this Contract.	One test per site unless the material visually appears to change.
On-site excavated materials along trenches.	One test per geographical area where material composition visually appears consistent.

COMPACTION COMPLIANCE TESTING REQUIREMENTS
(AASHTO T-191 or Portable Nuclear Gauges)

Trench Location	Testing Required
Street crossing with gravel or bituminous surfacing.	One test per lift for each crossing.
Parallel to centerline of bituminous or gravel surfaced streets or roadways.	One test per lift for each 500-feet of trench length.
Along unsurfaced roads or in cultivated or landscaped areas.	One test per lift for each 1,000-feet of trench length with at least one test per area.
Under or adjacent to manholes, wetwells, enclosures, boxes, etc.	None, unless geological conditions are inconsistent and requested by the Engineer.

NOTE: The term "test" shall mean a single test with acceptable results, equal to or better than specified minimums. In the event compaction test results fall below the required minimum density; the Contractor shall re-compact and test the material until a test with acceptable results is obtained. Any test failure shall result in additional tests as required by the Engineer, at no cost to the Owner, to ensure that overall project quality objectives are met.

02200.4 METHOD OF MEASUREMENT

02200.4.1 NO MEASUREMENT

02200.4.1.1 TRENCH EXCAVATION AND BACKFILL - Trench excavation and backfill will be considered incidental to other items shown in the Bid Schedule and separate measurement will not be made unless prescribed otherwise in the Contract Documents.

02200.4.1.2 SOLID ROCK EXCAVATION - Unless the Contract Bidding Documents contain provisions for "Solid Rock Excavation", no separate measurement or payment will be made for work requiring rock excavation.

02200.4.2 SPECIFIED SOLID ROCK MEASUREMENT

When listed as a separate item in the bid schedule, quantities of solid rock excavation shall be determined by the lineal foot unit, using a tape measure or other accurate measuring device to find the length of cut in lineal feet along the plane of cut. This measurement shall include all labor, equipment, materials, and related work, including, but not limited to, ripping, sawing, boring, hammering, blasting, rock trenching, excavating, removing, hauling, and disposal, if required, of the existing bedrock deemed qualified by the Engineer for payment of completed rock excavation.

02200.5 BASIS OF PAYMENT

Separate payment will not be made for trench excavation unless prescribed otherwise in the Contract Documents.

PAYMENT ITEM	UNIT
Solid Rock Excavation	Lineal Foot

SPECIAL PROVISION

TRENCH EXCAVATION AND BACKFILL — SECTION SP02200

Amend the following sections to include:

02200.3 CONSTRUCTION REQUIREMENTS

02200.3.12.3 DEWATERING - The Contractor shall perform grading and implement protective measures as necessary to prevent surface water and groundwater from entering trenches and other excavations. Temporary diversions shall be installed at Birch Creek and the spring as required, and all active surface flows shall be conveyed around excavations by approved piping or other methods.

All temporary diversion systems shall be designed, constructed, and removed in a manner that avoids permanent disturbance to the spring, streambed, and channel banks. Upon completion of the work, all affected areas shall be restored to pre-construction conditions or better.

Dewatering activities conducted at or in the vicinity of the spring box shall not adversely impact the quality or quantity of water entering the culinary water system, except for temporary interruptions necessary to complete the decommissioning of the existing line and connection to the new system. Following such work, cleaning and flushing shall be performed in accordance with the Contract Documents.

Water that accumulates in excavations from surface runoff or groundwater infiltration shall be promptly removed by pumping or other approved methods. All dewatering operations shall conform to the requirements of the approved stream alteration permit and are subject to review and approval by the ENGINEER.

02200.4 METHOD OF MEASUREMENT

02200.4.2.3 DEWATERING

Dewatering will be measured on a per-day basis for each day that active dewatering is required to facilitate construction. Measurement shall include all labor, materials, and equipment necessary to install, operate, maintain, and remove temporary dewatering systems, including but not limited to creek and spring diversions, conveyance piping for surface flows, and pumping of open excavations.

Dewatering days will only be measured when such activities are directly associated with and necessary for ongoing construction operations. The Contractor shall plan and execute the work to minimize the duration of dewatering and to maintain natural surface flow conditions to the maximum extent practicable.

No measurement will be made for dewatering activities initiated without a demonstrated construction need or for systems left in operation beyond the period required to support active construction.

02200.5 BASIS OF PAYMENT

The accepted quantities shall be paid for at the contract unit price:

PAYMENT ITEM	UNIT
Dewatering	Days

02202.1 DESCRIPTION

This section covers construction of roadways and embankments, roadway ditches, channel changes, furrows, slope rounding, benches, berms, dips, approaches, and subsidiary work.

02202.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 02208 – Flowable Backfill (required during winter months)

02202.1.2 SUBMITTALS

Not used.

02202.1.3 DEFINITIONS

Roadway - The graded portion of a road within the top of cut slopes and the toe of embankment slopes, excavated and placed to form a surface for vehicular travel.

Excavation - That portion of the roadway which is removed from its original position and deposited within the roadway as embankment.

Embankment - Excavated earth materials moved from an original source and placed within the roadway.

Unsuitable Material - Excavated earth materials determined by the Engineer to be unsuitable for placement in roadway embankment. Such materials may include rock too large for placement in embankment, topsoil containing excessive vegetative debris, unstable earth materials, etc.

Roadbed - That portion of the roadway graded to the surface upon which vehicles travel, including the shoulders.

Subgrade - The graded roadbed finished according to the details shown on the Drawings and prepared to receive surfacing when called for on the Drawings.

Borrow - Earth materials excavated from a designated source, outside the roadway, and placed in embankments within the roadway. Designated sources for borrow material shall be shown on the Drawings or elsewhere described in the Contract Documents, and shall be approved by the Engineer prior to being place in embankment.

Pioneering - The beginning or opening of a route on which a roadway is to be constructed prior to clearing or starting any earthwork excavation.

Structure Excavation - Excavation, backfill and/or disposal of material required in the roadway for construction of culverts, bridge foundations or other structures.

Cushion - Soil materials placed over rocks or solid rock portions of the roadway to provide a gradable surface. Cushion materials shall not contain rocks large than one-third of the minimum thickness of the cushion layer.

02202.2 MATERIALS

Not used.

02202.3 CONSTRUCTION REQUIREMENTS

This Work shall consist of furnishing all labor, equipment and materials for constructing a roadway, including borrow excavation, drainage excavation, removal of slide material, excavation of unsuitable material, embankment construction and disposal of all excavated material necessary for the completion of construction.

02202.3.1 CLEARING AND GRUBBING

Clearing and grubbing shall be accomplished in accordance with Section 02015 before any excavation or embankment begins, except that grubbing of stumps when approved by the Engineer may proceed concurrently with excavation, and the removal or burning of cleared debris may be delayed until weather permits. Excavation and placement operations shall be conducted so material to be treated under Section 02015 will not be incorporated in the roadway.

02202.3.2 PIONEERING

Pioneering operations for the top of excavation slopes, toe of embankments, or pioneer road construction shall be accomplished to prevent undercutting of the final excavation slope, depositing of materials outside of the roadway limits and any restriction of drainage.

02202.3.3 UTILIZATION OF EXCAVATED MATERIALS

All suitable excavated material shall be used in the construction of embankments, subgrades, shoulders, slopes, bedding and backfill for structures and for other purposes as shown on the Drawings and as described below:

02202.3.3.1 EXCESS EXCAVATION - Designed excess excavation shall be disposed of as shown on the Drawings.

02202.3.3.2 ROCK FOR SLOPE PROTECTION - When approved by the Engineer, excavated rock suitable for protection of embankments may be conserved and used in lieu of a designated materials source.

02202.3.3.3 CONSERVING MATERIAL - Material encountered in the excavation, suitable for cushion, road finishing or other purposes, may be conserved and utilized instead of materials from designated sources.

02202.3.3.4 EXCAVATION OF UNSUITABLE MATERIAL - Unsuitable material shall be excavated. Disposal will be as shown on the Drawings. Excavated areas shall be backfilled with suitable material when necessary to complete the Work. Frozen material shall not be placed in embankments. Rocks that are too large to be incorporated into the embankment shall be broken for incorporation into the embankment or maneuvered to the face of the embankment and embedded so that they will not roll or obstruct the use and maintenance of the roadbed, or moved to locations approved by the Engineer.

02202.3.3.5 CONSERVATION OF TOPSOIL - When indicated on the Drawings, suitable topsoil shall be removed, transported, and deposited in the designated stockpile areas.

02202.3.3.6 ABANDONED STRUCTURES AND OBSTRUCTIONS - Abandoned structures and obstructions shall be treated in accordance with Section 02500.

02202.3.4 DRAINAGE EXCAVATION

Drainage excavation shall include construction of side ditches, minor channel changes, inlet and outlet ditches, furrow ditches, ditches constructed along the road but beyond the roadway limits and

other minor earth drainage structures as shown on the Drawings. Excavated material shall be utilized in accordance with subsection 02202.3.3 above.

02202.3.5 FINISHING ROADBED

02202.3.5.1 OVERSIZE MATERIALS - For roads receiving aggregate base or surface course, only rocks that do not protrude above the subgrade more than one-third of the depth of the base or surface course or 3-inches, whichever is less, may remain in place.

For unsurfaced roads, unless otherwise shown on the Drawings, the top 4-inches below the finished road surface shall not contain rocks larger than 4-inches in greatest dimension. Oversize material shall be removed, reduced to acceptable size or covered by importing suitable material approved by the Engineer.

02202.3.5.2 SHAPING AND DRESSING - The subgrade shall be visibly moist during shaping and dressing. Low sections, holes, cracks or depressions shall be brought to grade with suitable material approved by the Engineer. Final compaction of the subgrade shall meet the requirements of the embankment placing method specified.

02202.3.6 SNOW REMOVAL

Snow and/or ice shall not be incorporated into the embankment. Snow shall be removed in advance of the work to be performed and shall be deposited beyond the roadway limits in a manner that will not result in erosion or waste material.

02202.3.7 FINISHING SLOPES

02202.3.7.1 SLOPE SURFACE - Slopes shall be finished as closely as is practicable to the lines staked on the ground or shown on the Drawings. The finished slope shall be left in a slightly roughened condition to facilitate the establishment of vegetative growth. The finish associated with template and stringline or hand-raking methods will not be allowed. Loose rock, loose debris and other loose material, each of which is large than 6-inches in diameter, shall be removed from the slope unless otherwise shown on the Drawings.

02202.3.7.2 SLOPE TOP - The tops of excavations, excluding areas of solid rock, shall be blended with the adjacent terrain by rounding when shown on the Drawings. Decomposed rock that may be cut without blasting or ripping shall be rounded. Earth overlying rock shall be rounded above the rock.

02202.3.8 BLASTING

02202.3.8.1 CONTROLLED BLASTING - All rock excavations that require blasting shall be formed with controlled blasting techniques unless otherwise shown on the Drawings. Controlled blasting is defined as the controlled usage of explosives and blasting accessories in appropriately aligned and spaced drill holes for the purpose of producing a free surface or shear plane in the rock excavation slopes and of minimizing landscape damage, adjacent ground vibration and overbreak. Presplitting is not intended unless shown on the Drawings and described in the Contract Documents.

02202.3.8.2 TEST SECTIONS - Unless directed otherwise by the Engineer, the Contractor shall drill, blast and excavate short test sections (not to yield in excess of 1,000 cubic yards) to determine the controlled blasting method, hole spacing and charge best suited to the material encountered.

02202.3.9 OVERBUILDING

Unless otherwise agreed to by the Engineer, excavation or embankment material shall be confined within the roadway limits to avoid overbuilding and to protect the adjacent property.

02202.3.10 SUBGRADE TREATMENT

02202.3.10.1 TREATMENT MATERIALS - Subgrade treatment shall consist of soil modification by mixing aggregates, placing geotextiles, fiber mat, rock blanket or other similar materials over areas of unsuitable embankment foundation material that will be indicated on the Drawings. The construction and material requirements for the subgrade treatment will be specified in the Contract Documents.

02202.3.10.2 SWAMPY GROUND - When an embankment is to be placed across swampy ground and removal of unsuitable material or subgrade treatment is not required, the lower part of the embankment may be constructed in a single layer to the minimum depth necessary to support construction equipment.

02202.3.11 EMBANKMENT PLACEMENT

All embankments shall be placed by one or more of the following methods as shown on the Drawings and listed in the Bid Schedule.

02202.3.11.1 METHOD 1 - SIDE CASTING AND END DUMPING - Embankment may be placed by side casting and end dumping. Where material containing a large amount of rock is used to construct embankments, a solid embankment shall be provided by working smaller rocks and fines in with the large rocks and fines to fill the voids.

02202.3.11.2 METHOD 2 - LAYER PLACEMENT - Surfaces steeper than a ratio of 3 horizontal to 1 vertical (3:1) upon which embankment is to be placed, shall be roughened or stepped when shown on the Drawings to provide permanent bonding of new and old materials.

- Embankment shall be layer placed, except over rock surfaces, in which case material may be placed by end-dumping to the minimum depth needed for operation of spreading equipment. Each embankment layer shall be leveled and smoothed before placement of subsequent layers. Hauling and spreading equipment shall be operated uniformly over the full width of each layer.

- Suitable material shall be placed in layers no more than 12-inches thick, except when the material contains rock more than 9-inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. No layer shall exceed 24-inches before compaction.

- Placing individual rocks or boulders greater than 24-inches will be permitted provided the embankment will accommodate them. Such rocks and boulders shall be at least 6-inches below subgrade. They shall be carefully distributed and the voids filled with finer material to form a dense and compacted mass.

- Where material containing large amounts of rock is used to construct embankments, the layers may be of sufficient thickness to accommodate the material involved. A solid embankment with adequate compaction shall be constructed by working smaller rock and fines in with the larger rocks to fill the voids and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

- Material shall be at a moisture content suitable to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Excessively wet excavated material shall be handled in accordance with Subsection 02202.3.3.1.

02202.3.11.3 METHOD 3 - LAYER PLACEMENT (ROLLER COMPACTION) - Embankments shall be placed as specified in Method 2. Placement shall be in horizontal layers not exceeding 12-inches prior to compaction, except when the material contains rock more than 9-inches in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. Compaction shall be

obtained with equipment in compliance with the requirements described in the Specifications. Compaction equipment shall be operated over the full width of each layer until visible deformation of the layer ceases or, in the case of the sheepsfoot roller, the roller "walks out" of the layer. At least three complete passes will be made.

02202.3.11.4 METHOD 4 - CONTROLLED COMPACTION - Embankments shall be placed as specified in Method 2 except earth embankments shall be placed in horizontal layers not exceeding 12-inches (loose measure) and compacted. Material shall be at a moisture content suitable for attaining the required compaction. Embankments and the top 1-foot of excavation sections shall be compacted to at least 95 percent of the maximum density as determined by AASHTO T 180, Method C or D.

- The density of the embankment material shall be determined during the progress of the Work in accordance with AASHTO T 191, T 205 or T 238; T 217, T 239 or T 255; and T 224.

- Density requirements will not apply to portions of rock embankments that cannot be tested in accordance with approved methods. When this condition exists, compaction shall be provided by working smaller rocks and fines in with the larger rocks to fill the voids and by operating equipment over the embankment materials.

02202.3.12 COMPACTION EQUIPMENT

02202.3.12.1 EQUIPMENT - Compaction equipment shall be capable of obtaining compaction requirements without detrimentally affecting the compacted material. The compacting units may be any one of the types described herein, provided they are capable of compacting each lift of material as specified and meet the minimum requirements contained herein.

02202.3.12.2 ROLLER REQUIREMENT - Minimum requirements for rollers are as follows:

- Sheepsfoot, tamping or grid rollers shall be capable of exerting a force of 250 pounds per inch of width of roller drum.

- Steel-wheel rollers, other than vibratory, shall be capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.

- Vibratory steel-wheel rollers shall have a minimum weight of 6 tons. The compactor shall be equipped with amplitude and frequency controls and specifically designed to compact the material on which it is used.

- Pneumatic-tire rollers shall have smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi.

02202.3.13 CONSTRUCTION TOLERANCES

Unless provided otherwise herein, a specific tolerance class for allowable deviation from construction stakes and Drawings shall be shown on the Drawings. A Table of Tolerance is provided below:

TABLE OF TOLERANCES

MEASUREMENT	TOLERANCE CLASS		
	A	B	C
Roadbed Width	+0.5	+1.0	+2.0
(feet) Subgrade Elevation	±0.1	±0.2	±0.5
(feet) Centerline Alignment	±0.2	±0.5	1.0

Deviations shall be uniformly graded in the direction of change for a distance of 200-feet or more along the roadway. Roadway ditches shall always be constructed to flow in the direction shown on the Drawings, regardless of allowable deviations. Roadbed width shall be no less than the dimension shown on the Drawings or staked in the field. When a tolerance class is not otherwise indicated on the Drawings, Class B tolerance deviations will be allowed for roadway construction.

02202.3.14 WATER

Water provided for compaction, dust control, or planting and care of vegetation, shall be developed, hauled and applied in accordance with Section 02204.

02202.4 METHOD OF MEASUREMENT

02202.4.1 ROADWAY EXCAVATION

02202.4.1.1 SEPARATE MEASUREMENT - When shown as a separate item on the Bid Schedule, quantities of roadway excavation, in cubic yards, shall be determined, for undisturbed material in its original position on the ground, as measured by slope staking performed before the start of construction. Unless shown otherwise herein, measurement for roadway excavation shall include the following:

- All loosening, loading, transportation, spreading, compaction and grading required to achieve the staked grades and alignment.
- Material excavated below the required grade and beneath embankment areas when shown on the Drawings or directed by the Engineer.
- Ditches located outside of the roadway, except when they are included as an item on the Bid Schedule.
- Topsoil or other material removed and stockpiled as directed, when not measured as a separate pay item.
- Borrow material used in the Work, except when borrow is included in the Bid Schedule.
- Slide material not attributable to the negligence of the Contractor.
- The volume of materials taken from stockpiles and used in the Work, except materials included in other pay items.

02202.4.1.2 NO MEASUREMENT - Measurement for roadway excavation shall not include the following:

- Material used for other than approved purposes.
- Unauthorized excavation or borrow.
- Quantity of material excavated from slope rounding.
- Overbreakage from the backslope in rock excavation requiring blasting.
- Material scarified in place to receive the first layer of embankment.
- Benching or stepping existing ground for embankment foundation.
- Stepping or scaling cut slopes.

- Oversize material removed when finishing unsurfaced roads.

02202.4.2 ROADWAY EMBANKMENT

When shown as a separate item in the Bid Schedule, measurement of quantities for roadway embankment will be by the cubic yard as determined from slope stake information taken prior to construction, for materials in place, compacted, and accepted.. Unless shown otherwise herein, measurement shall include all loosening, loading, transportation spreading, compaction and grading required to achieve the staked grades and alignments.

02202.4.3 ROADWAY BORROW

When shown as a separate item in the Bid Schedule, quantities for roadway borrow, calculated in cubic yards, shall be measured by. comparing preliminary cross-sections of the material on the undisturbed ground to other cross sections taken following its removal. Measurement shall include all loosening, loading and transportation to the location of the embankment designated for deposit.

02202.4.4 WATER

02202.4.4.1 NO SEPARATE MEASUREMENT - Unless shown as a separate item in the Bid Schedule, no separate measurement shall be made for water required for compaction, handling or other purposes associated with earthwork excavation and embankment.

02202.4.4.2 SEPARATE MEASUREMENT - When included as a separate item, measurement will be made in accordance with Section 02204.

02202.4.5 TOPSOIL

When topsoil stripping and stockpiling is included as a separate item in the Bid Schedule, measurement will be by the cubic yard placed in stockpiles at designated locations shown on the Drawings or directed by the Engineer. Measurement shall include loading, transportation and placement into stockpiles at designated locations.

02202.4.6 TOPSOIL SPREADING

When topsoil spreading is included as a separate item in the Bid Schedule, measurement will be by the square yard of surface on which the material is spread at a depth indicated in the Drawings. Such measurement shall include loading from a stockpile or designated source, transporting and spreading to the required depth.

02202.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
Roadway Excavation (Placement Method)	Cubic Yard
Roadway Borrow (Placement Method)	Cubic Yard
Roadway Embankment (Placement Method)	Cubic Yard
Subgrade Treatment (Type)	Square Yard
Drainage Excavation (Type)	Lineal Foot
Drainage Excavation (Type)	Cubic Yard
Topsoil (Stripped & Stockpiled)	Cubic Yard
Topsoil (Spread)	Square Yard

02204.1 DESCRIPTION

Furnish and apply water for: dust control, pre-wetting, mixing or compacting earth materials for road, site, and/or trench construction, and for other needs associated with the Work.

02204.1.1 RELATED WORK

Not used.

02204.1.2 SUBMITTALS

Not used.

02204.1.3 DEFINITIONS

Not used.

02204.2 MATERIALS

Water shall be free of dirt and silt or any substances injurious to plant life. A separate supply of potable water shall be provided for drinking when it becomes necessary to provide water for workers.

02204.3 CONSTRUCTION REQUIREMENTS

Water provided for construction shall be obtained from a source approved by the Engineer and sufficient to provide for the anticipated needs of the contract.

Water hauling equipment shall have watertight tanks of known capacity and shall be equipped with a pressure pump and spray system with the capability of applying the whole load uniformly. The spray system shall have a positive shut-off control. The water tank shall have a minimum capacity of 1,000 U.S. Gallons, and the capacity shall be clearly marked on the tank. The Contractor may be required to verify the tank capacity.

A water meter may be used for water dispensing, providing its measurement can be verified.

02204.4 METHOD OF MEASUREMENT

Unless indicated otherwise in the Bid Schedule, no separate measurement will be made for water used for pre-wetting, mixing, or compaction of earth materials or for dust control.

When shown in the Bid Schedule, water shall be measured to the nearest 1/10th of 1000 gallons in calibrated tanks or tanks with approved metering devices that indicate volume in 100-gallon quantities.

02204.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAYMENT ITEM	UNIT
Water	M Gallons (1,000 US Gallons)

02206.1 DESCRIPTION

This section covers activities associated with two types of temporary road use. These are construction and use of access roads and use of existing roads which are part of the construction zone.

02206.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 01300 - Submittals
Section 02005 – Traffic Control
Section 02015 - Clearing and Grubbing
Section 02105 - Earthwork Materials
Section 02202 – Roadway Excavation and Embankment

02206.1.2 SUBMITTALS

When gravel surfacing is required, the Contractor shall submit samples and/or test data for those materials in accordance with Sections 02105 and 01300.

02206.1.3 DEFINITIONS

Access Roads – A project site access road built specifically for temporary use by project related vehicles during the construction phase of the Work. The road may be on or partially on the construction zone or only end at it.

Temporary Use of Roads – Use of an existing paved or unpaved roadway during the construction phase of a project involving degradation of the surface and/or the use of the road by the public. Temporary road use may constitute use of the roadway as all or part of the construction zone or as an immediate approach to the construction zone.

02206.2 MATERIALS

02206.2.1 ACCESS ROADS

When shown on the Drawings, surfacing material for access roads shall be Untreated Base Course (UBC) gravel which meets the requirements of Section 02105.

02206.2.2 TEMPORARY USE OF ROADS

Materials requirements for restoring and resurfacing existing roads that have been damaged or disturbed during construction will be as shown on the Plans and described elsewhere within these Specifications.

02206.3 CONSTRUCTION REQUIREMENTS

02206.3.1 ACCESS ROADS

Consists of excavating, filling, installing gravel surfacing, and other work necessary to construct minor access roads for which cut and fill quantities will not be determined.

02206.3.1.1 CLEARING - The area to be disturbed by the road construction operation shall be cleared of all trees, brush, rubbish and other objectionable matter in accordance with Section 02015 prior to beginning the trenching operation. Trees, brush, rubbish and other materials resulting from the clearing operation shall be removed and disposed of at a land fill approved by the local public authority or designated by the Engineer. Removal of these materials shall be considered as part of

the Work for access road construction and no separate measurement and payment will be made for their removal.

02206.3.1.2 UNSUITABLE MATERIAL - Material shall be considered unsuitable for fill, sub-grade, shoulders and other uses if it contains organic matter, soft spongy earth or other matter of such nature that compaction to the specified density is unobtainable.

Material that is unsuitable for the intended use shall be excavated and removed from the site to an approved disposal site or otherwise disposed of as directed by the Engineer.

02206.3.1.3 SLOPES – Slopes shall be as follows:

- Excavation slopes shall be finished in conformance with the lines and grades shown on the Drawings. Debris and loose material shall be removed.

- Tops of slopes shall be rounded as shown on the Drawings. Excavation and embankment lines shall conform to those shown on the Drawings. When completed, the road grade shall be uniform and shall provide a smooth driving surface for vehicles.

02206.3.1.4 MATERIAL AVAILABILITY - The Contractor shall utilize all suitable excavated material within the roadway. When it is determined that sufficient excavated material is not available to construct required embankment, the Engineer may designate borrow sites and, if deemed to be changed conditions, appropriate changes will be negotiated in accordance with the General Conditions.

02206.3.1.5 COMPACTION - Materials in embankments shall be placed in layers not more than 12-inches in thickness and then wheel rolled with the equipment used for placement.

Placement of surfacing shall be made in accordance with the details shown on the Drawings and then compacted by wheel rolling with equipment used for placement.

02206.3.1.6 TRAFFIC CONTROL - At all points where access roads come into contact with public thoroughfares, the Contractor shall establish and maintain adequate traffic control as described in Section 02005 and as required by the specifications of the state or local highway or road department having authority at the site.

02206.3.1.7 ENVIRONMENTAL CONTROL – During construction and use of access roads, the Contractor shall observe the requirements of Section 01520 with particular regard to dust abatement.

02206.3.2 TEMPORARY USE OF ROADS

02206.3.2.1 TRAFFIC CONTROL - At all times when the Contractor is making temporary use of public thoroughfares, the Contractor shall establish and maintain adequate traffic control as described in Section 02005 and as required by the specifications of the state or local highway or road department having authority at the site.

02206.3.2.2 PASSIBILITY – When a portion of a public thoroughfare is being utilized for construction purposes, the Contractor shall maintain as many open lanes as possible for the passage of traffic consistent with safety and good construction practice. Lanes open to traffic shall be managed and maintained free of any debris or material that might passibility and public safety.

When traffic must be limited to the use of only one lane, traffic flow shall be managed so that no undue or unreasonable delays occur. If travel on all lanes of the roadway must be interrupted for an extended period of time, the Contractor shall first prepare an adequate detour plan and have it approved by the local road or highway department.

02206.3.2.3 ENVIRONMENTAL CONTROL – While using existing roads for construction purposes, the Contractor shall observe and be responsible for the requirements of Section 01520 with particular regard to dust abatement. When sprinkling with water is being used to control dust, the Contractor shall make as many passes as are necessary, and as may be directed by the engineer, to keep the creation of dust at a minimum. While sprinkling, the Contractor shall take particular care to avoid creating slippery or otherwise hazardous conditions on any part of the roadway being used for vehicular traffic.

02206.4 METHOD OF MEASUREMENT

02206.4.1 CONSTRUCTION OF ROADS

Measurement for construction of access roads shall be made by the number of lineal feet of road excavated, compacted and graded to provide either a driveable surface or a base ready for installing gravel surfacing.

02206.4.2 GRAVEL SURFACING

Separate measurement for gravel surfacing shall be made in accordance with Section 02105 for Untreated Base Course.

02206.4.3 TEMPORARY USE OF ROADS

Restoration and resurfacing of roads disturbed or damaged during temporary use for construction shall be included with other items on the Bid Schedule and no measurement or payment for this work shall be made under this specification.

02206.5 BASIS OF PAYMENT

The accepted quantity will be paid for at the contract unit price for:

PAY ITEM	UNIT
Access Road	Lineal Foot

SPECIAL PROVISION

SPRING LINER	SECTION SP02210

02210.1 DESCRIPTION

This section covers construction of the protective liner for the spring and collection box.

02210.1.1 Includes furnishing all labor material and equipment required to complete lining of a spring source area and installation of cutoff ditches located as shown on the DRAWINGS.

02210.1.2 The intent of this WORK is to protect the water bearing strata within the designated area of the spring from surface infiltration. Because of the variations which can occur in geologic formations, unknown subsurface conditions such as shallow solid rock may occur which will require deviation from the development plans indicated on the DRAWINGS. As excavation in the spring area proceeds, the ENGINEER will be on-site to provide interpretation and determine the extent of excavation required to protect the spring area. Should changes of quantities occur during this excavation, the procedure prescribed in Part 13 of Section 00700 "GENERAL CONDITIONS" for making such changes shall be followed.

02210.1.3 RELATED WORK

Section 02015 – Clearing and Grubbing
Section 02105 - Earthwork Materials
Section 02900 - Landscaping

02210.1.4 SUBMITTALS

02210.1.4.1 All information shall be provided in accordance with Section 01300 and written evidence of compliance from the manufacturer shall accompany each delivery of material.

02210.1.4.2 The Contractor shall submit for review complete information showing all materials be used in the spring liner, including but not limited to: 40 mil plastic liner, and clay.

02210.2 MATERIALS

02210.2.1 All materials coming into contact with the spring water shall comply with National Sanitary Foundation (NSF) Standard 61.

02210.2.2 Polyethylene Liners. The polyethylene liner for spring protection and cutoff walls shall be produced from a pipe grade high-density polyethylene (HDPE) resin and have a minimum thickness as shown on the plans. It shall be NSF approved

02210.2.3 Clay – Material shall be “pit run bentonite” and shall exhibit a permeability of 1×10^{-6} cm/sec. In addition, the material shall pass the No. 200 sieve and have a plasticity index greater than 12. Material shall be free of cinders, ashes, wood, and vegetation; frozen or other deleterious materials.

02210.3 CONSTRUCTION REQUIREMENTS

02210.3.1 Excavation within the spring area shall not proceed until the ENGINEER or a designated representative is present. Clearing and grubbing within the spring area must be completed prior to starting any excavation.

02210.3.2 Equipment capable of operating in unstable conditions on a 2:1 slope shall be provided for clearing, grubbing, excavating and lining.

02210.3.3 The CONTRACTOR shall provide necessary protective measures to prevent contamination with excavated topsoil, surface debris, fuels and equipment lubricant, etc.

02210.3.4 Before placing filter fabric or plastic sheeting the exposed ground surface will be prepared so that no sharp rocks will be in contact with the fabric or sheeting.

02210.3.5 Following clearing and grubbing and excavation of the terraces and cutoff ditches, the polyethylene linear shall be installed according to manufacturer specifications over the excavated area such that seams overlap to shed water downhill and away from the spring box. The liner should lay free of tension and conform to the ground surface with no underlying air gaps. Smooth stones may be used to hold the liner in place until backfill is placed.

02210.3.6 When backfilling the clay shall be filled so that no water will be accumulated on its surface. At least 12-inches of clay shall then be placed over the plastic lined area. Backfill material shall be sorted during placement to assure that no rocks larger than 2" or sharp rocks are placed against the plastic.

02210.3.7 Compaction of backfilled clay over the spring collection area shall consist only of wheel rolling sufficiently to support backfilling and grading equipment.

02210.3.8 Finish grading and shaping of the backfilled clay and stockpiled topsoil material shall be done in a manner that surface water drainage will occur away from the spring collection area.

02210.3.9 Grading of the area will include construction of drainage and cut-off ditches intended to divert surface run-off away from the spring collection area. Both the drainage and the cut-off ditches shall be sized and located as shown on the DRAWINGS.

02210.3.10 Restoration of the area will include stripping and replacing topsoil evenly over the lined area to a minimum depth of 6" and then reseeding and anchoring biodegradable coconut fiber erosion control mat in accordance with Section 02900.

02210.4 METHOD OF MEASUREMENT

02210.4.1 Installing 40 mil polyethylene liner shall be measured by the square foot of liner installed by neat line measurements of the length and width. It shall include preparation of the subgrade, anchor trenches, and seam sealing.

02210.4.2 Installation of clay liner shall be determined by the square yards calculated by multiplying the measured slope length by the measured breadth for a depth of 1' of material in place and accepted.

02210.4.2 Stripping and replacing topsoil shall be measured by the square yard with neat line measurement of slope length and width where topsoil was removed to a minimum depth of 6" and shall include all labor and material necessary to do so.

02210.4.3 Installation of erosion control mat will be measured by the square foot of mat installed and will include all labor and materials for properly setting and anchoring the mat according to the manufacturer specifications. The prerequisite reseeding will be a separate measurement and pay item.

02210.4.34 Installation of cutoff ditches will be measured by lineal foot of ditch excavated and will include all labor and materials necessary.

02210.5 BASIS OF PAYMENT

02210.5.1 The accepted quantities will be paid for at the contract unit price:

SPECIAL PROVISION

SPRING LINER	SECTION SP02210

PAY ITEM	UNIT
Install 40 Mil HDPE Spring Liner	SQ. FT.
Install 1’ thick Spring Clay Liner	SQ. YD.
Strip and Replace 6” Topsoil	SQ. YD.
Install Erosion Control Mat	SQ. FT.
Install Cutoff Ditch	LN. FT.

02222.1 DESCRIPTION

This section covers furnishing and installation of pipe and fittings of the type, class and size designated for the water system defined on the Drawings, in these Specifications, and elsewhere in the Contract Documents.

02222.1.1 RELATED WORK

Section 02105 - Earthwork Materials
Section 02200 - Trench Excavation and Backfill
Section 15110 - Pipe and Piping Systems
Section 15230 - Waterline Valves and Hydrants
Section 15232 - Water System Control Valves
Section 15234 - Water Service Connections
Section 15236 - Water Main Flow Meters

02222.1.2 SUBMITTALS

02222.1.2.1 MATERIALS AND EQUIPMENT - The Contractor shall submit for review complete information, showing all pipe, materials, fittings, gaskets, couplings, coatings, linings, supports, mechanical restraints, thrust blocks and configuration prior to the delivery of any components to the project. All information shall be provided in accordance with Section 01300 and written evidence of compliance from the manufacturer shall be provided with each delivery of material.

02222.1.2.2 TESTING - As construction proceeds, the Contractor shall submit test documentation in accordance with this section of these Specifications.

02222.1.3 DEFINITIONS

Fitting - Any component of a pipeline, excluding the pipe itself and valves and meters, which is used for connecting pipe sections; changing line direction or size; connecting meters, valves, tanks, etc.; or starting or terminating pipelines.

Mains - Water distribution pipes, located in streets or rights-of-ways, to which water service connections are made for users of the system.

Run - Any identified section of a pipeline.

Saddle - A fitting placed on a pipe to reinforce the pipe wall, through which a tapping hole is drilled.

Service Lateral – The line which connects to the water meter or to the service stub at the property line extending from there, on private property, to the plumbing at the foundation of a house or business.

Service Stub – The line running from the tap on a main to the meter or to the property line as appropriate.

Tap - The actual connection made to water mains which includes drilling an opening into the main, threading, installing a tapping saddle when appropriate, and installing a valve into the opening.

02222.2 MATERIALS

02222.2.1 PIPE AND FITTINGS

See Section 15110

02222.2.2 PIPELINE LOCATION IDENTIFIERS

Pipeline location identifiers generally take the form of marker posts, warning tape, and tracer wire.

02222.2.2.1 TRACER WIRE - Unless otherwise described on the plans or herein, the tracer wire shall be an insulated, #12, direct bury copper wire designed and manufactured for this purpose.

02222.2.2.2 WARNING TAPE - The warning tape shall be an inert, plastic, direct bury type with a 2-inch minimum width, of the appropriate safety color, and specifically manufactured for underground utility identification. The tape shall have wording imprinted on it identifying the type of utility it is protecting.

02222.2.2.3 MARKING POSTS - Shall be fiberglass compound, aluminum, or other corrosion resistant metal of 5-foot length and 4 inches wide, or otherwise as shown on the Drawings. They shall be fitted with a deterioration resistant warning notice or label appropriate to the application.

02222.2.3 MISCELLANEOUS FITTINGS AND MATERIALS

02222.2.3.1 POLYETHYLENE ENCASEMENT - Where soil conditions are determined to be severely corrosive and when shown on the Drawings or required in the Contract Documents, tubular polyethylene encasement shall be installed around buried ductile iron piping and fittings in accordance with ANSI/AWWA C-105.

02222.2.3.2 CASING PIPE - Where casing pipe is called for on the Drawings or is required by the Engineer, the Contractor shall furnish and install the casing in accordance with Sections 02315 and 02320 of these specifications.

02222.2.3.3 PIPE PENETRATION OR CASING SEALS - Where required on the Drawings or in these Specifications, the Contractor shall furnish and install pipe-to-wall linked rubber seals in core drilled structures, walls, pipe sleeves, or casings in accordance with the manufacturer's instructions. Seals shall be link seals by Thunderline Corporation, or an approved equal.

02222.2.3.4 PIPE RESTRAINTS – Pipe restraints shall be as follows:

- Concrete thrust blocking shall be formed, sized, and placed as described herein and shown on the Drawings. Reinforcing bars used in thrust block construction shall be preformed and fusion bonded epoxy coated.

- Mechanical restraint of piping shall be accomplished with one of the following restraining systems or an approved equal:

  ⇒ Grooved Ductile Iron AWWA Couplings by Victaulic Company of America (use only with exposed piping systems).

  ⇒ MEGALUG thrust restraints by EBAA Iron Sales, Inc.

  ⇒ FIELDLOK restraint gaskets by U.S. Pipe Company. Without the written approval of the Engineer, use of this restraint device is limited to joints in carrier pipe installed in a casing pipe.

All joints of pipe installed under streambeds or canal crossings, or installed in casing pipes, shall be protected with mechanical restraint.

Restraint protection of above ground or exposed piping in buildings or enclosures shall be accomplished only with mechanical restraints.

02222.3 CONSTRUCTION REQUIREMENTS

02222.3.1 HANDLING AND APPROVAL OR REJECTION OF MATERIALS

All materials delivered to and used at the job site are subject to approval of the Engineer or the Owner. Care shall be taken during handling of pipe, to avoid any impact which might cause damage. Dropping pipe during unloading will not be permitted. Pipe will be carefully inspected in the field before and after laying. If any cause for rejection is discovered in a pipe before or after laying, it shall be removed and replaced by the Contractor, at no additional cost to the Owner. Any pipe found to be unfit or rejected due to cracks, broken bells or spigots, irreparable chipped lining, etc., shall be removed from the job site.

02222.3.2 DIAGRAMMATIC LAYOUT

Piping layout on the Drawings shall be considered diagrammatic for all piping not shown with detailed dimensions. When this is the case, pipe size and location are provided, but the Drawings are not intended to show every offset, fitting, or structural difficulty that will be encountered during project construction.

02222.3.3 ALTERATION OF ALIGNMENT

At no additional cost to the Owner, and with written permission from the Engineer, piping alignment may be varied from that shown on the Drawings, to avoid structural or mechanical difficulties, or to avoid the work of other trades. The Contractor still will be liable to provide all materials and labor required to complete all work in accordance with the best practice of the trade, and to the satisfaction of the Engineer.

02222.3.4 INSTALLATION

02222.3.4.1 DEWATERING - Prior to pipe laying and jointing, sufficient dewatering effort shall be provided to maintain the ground water level at or below the surface of the trench bottom or base of the bedding course. The dewatering operation, however accomplished, shall be carried out in such a manner as to not permanently disturb natural underground water conditions.

02222.3.4.2 CONNECTION TO EXISTING FACILITIES - When connections are to be made to any existing pipe or appurtenances, for which the actual elevation or position cannot be determined without excavation, the Contractor shall excavate for, and expose the existing pipe or appurtenances before laying any new pipe. The Engineer shall be allowed to inspect the existing pipe or appurtenances before any connection is made. The Contractor shall make any adjustments in line or grade which may be necessary to accomplish the intent shown on the Drawings.

Where new fittings, valves, meters, restraints etc., are required to be installed in, or attached to, existing piping, or where connections are to be made to existing piping, the Contractor shall furnish and install the necessary components needed to accomplish the work, whether or not specifically indicated on the Drawings.

02222.3.4.3 CAPPING PIPE END - At the close of each workday, or whenever the work ceases for any reason, the end of the pipe shall be securely closed, unless otherwise permitted by the Engineer.

02222.3.4.4 JOINING – Joining of pipe shall be as follows:

- When making connections, pipe shall be cut and beveled in a neat and workmanlike manner, so as to provide a smooth, beveled end at right angles to the axis of the pipe. Pipe and fittings shall be assembled so there will be no distortion or springing of the pipelines. Flanges, unions, flexible couplings and other connections shall come together at the proper orientation. The fit shall not be made by springing any piping, nor shall orientation or alignment be corrected by taking up on any flange bolts. Flange bolts, union halves, flexible connectors, etc., shall slip freely into place. If the proper fit is not obtained, the piping shall be altered to fit.

- PVC pipe, 2 inches and smaller in diameter, shall be joined by solvent welding. No disturbance of joints, including from trench backfill operations, will be allowed until solvent welded joints are cured.

- PVC pipe, larger than 2 inches in diameter, shall be joined by means of gasketed joints.

- With bell and spigot joints, care should be taken to properly align the pipe before joints are forced home. Gaskets shall be lubricated in accordance with manufacturer's instructions. During insertion of the spigot end, the pipe shall be partially supported by hand, sling, or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since the most flexible gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home.

- Where fusion of polyethylene pipe joints is required, sections of pipe shall be joined in a continuous length on the job site above ground. Joining shall be by the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. Equipment used for butt fusion joining shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements, alignment, and fusion pressures.

02222.3.4.5 LAYING - All pipe laid shall be retained in position, using mechanical means if necessary, so as to maintain alignment and joint closure until sufficient pipe bedding and backfill have been completed to adequately hold the pipe in place. All pipe shall be laid to conform to the prescribed line and grade shown on the plans, within specified limits. No blocking of any kind shall be used to adjust the pipe to grade, except when used with concrete embedment. Bedding materials shall be placed so the bottom surface of the pipe will have full bearing for the entire barrel length. The pipe shall rest on not less than 1/4 of its outside perimeter. Bell holes shall be dug as required to assure uniform support along the barrel but shall be no larger than necessary.

Unless otherwise approved by the Engineer, pipe shall be laid upgrade from the point of connection on the existing pipeline or from a designated starting point. Pipe shall be installed with the bell end forward or upgrade, unless approved otherwise. When pipe laying is not in progress, the forward end of the pipe shall be kept closed with an approved temporary plug.

02222.3.4.6 PIPE RESTRAINT – Pipe restraint work shall be as follows:

- The Contractor shall provide and install either concrete thrust blocks or mechanical pipe restraints on all pressure piping not connected with bolted flanges or welded joints.

- For projects involving pipeline construction covered under this section of the Specifications, a pipe restraint schedule is included in the Drawings. Pipe restraints (thrust blocks and/or mechanical restraints) shall be furnished and/or constructed and installed as shown on the Drawings and described in the schedule.

- Pressure pipe shall be properly blocked or restrained at all fittings, wherever the pipeline makes a change in direction of 11.25 degrees or more, wherever it changes sizes, or wherever it ends.

- Placement of concrete thrust blocking shall provide bearing against undisturbed vertical earth banks or approved compacted backfill, sufficient to absorb thrust from line pressure, and in a configuration so that pipe joints and fittings will be accessible.

- All restraints shall be in place before any hydrostatic testing and flushing are performed on the system.

- The Contractor shall allow visual inspection of every thrust block or mechanical restraint before it is buried.

02222.3.4.7 FINISH BEDDING - After the pipe is laid, additional bedding material shall be placed in 6-inch lifts to a level even with the spring line of the pipe and compacted. The portion of the trench from the spring line to 12 inches above the top of the pipe shall then be filled and compacted in the same way.

02222.3.4.8 REQUIREMENTS FOR INSTALLATION NEAR SEWER LINES - Locate potable water piping at least 10 feet horizontally (measured edge to edge) from any existing or proposed parallel sewer or wastewater leach line. Should conditions prevent the 10-foot separation, upon the Engineers approval the water line may be laid closer than 10 feet to sewer lines (but not leach lines) provided:

- The water line is laid 18 inches above the top of the sewer line, but deep enough to prevent freezing, and

- There is no groundwater impacting the trench, and

- No sewer force main exists, and

- The water line is laid in a separate trench, or

- The water line is laid on an undisturbed earth shelf on one side of the sewer line trench, or

Where potable water lines cross sewer lines, the bottom of the water line shall be at least 18 inches above the top of the sewer line for ten feet on each side of the sewer line, measuring perpendicularly from the water line to the sewer line. When such vertical separation is impossible to achieve, a vertical separation of less than 18 inches may be allowed provided:

- In new construction for both water line and sewer line they shall be constructed of ductile iron pipe or thermoplastic pipe joined by either mechanical or bolted flange joints.
- In situations with an existing sewer line, the new water line shall be constructed as previously described.

- And, when making such crossing, install the water line in such manner that the center of a full length of pipe is on the centerline of the sewer line to isolate the water line joints as far as possible from the sewer line.

02222.3.4.9 EXPOSED PIPING - No exposed piping shall be installed until all equipment to which the pipe is to be attached has been installed and it can be determined where piping and fittings shall be located to make a neat, efficient arrangement. Piping shall be aligned with equipment connections such that no external load or stress will be transferred to any equipment from the piping. Piping

shall be installed with a sufficient number of unions, flexible couplings, or flanged joints, in addition to those shown on the Drawings, to allow for convenient inspection and maintenance.

Exposed pipe work shall be suspended or supported, to prevent sagging or over-stressing of the pipe and connections. Assembly of pipe and fittings shall be accomplished so there will be no distortion or springing of the pipe. The fit shall not be made nor the alignment corrected by taking up on any flange bolts. Joints shall come together in proper orientation, and Flange bolts, union halves, flexible couplings, and etc. shall slip freely into place. If the proper fit is not obtained, the piping shall be altered to make the fit meeting the above requirements.

Exposed pipe shall be installed in straight runs parallel to the axis of the structures. Pipe runs shall be horizontal and vertical; except that gravity drain lines shall be pitched down in the direction of flow at a slope not less than 1/8 inch per foot.

All exposed pipe shall be painted in accordance with Section 09910 of these Specifications. Factory finished items are not required to be field painted except touch-up. The color and type of paint used shall be submitted to the Engineer for his approval.

02222.3.4.10 DRAINS AND OTHER SYSTEMS - In addition to other requirements in this Section, all irrigation and other lines fitted with drains shall be installed such that continuous slope is maintained to designated drain locations. In areas where there are both culinary water pipelines and irrigation pipelines, exposed portions of irrigation water piping shall be identified by distinctive coloring or other marking. Culinary and irrigation lines and extensions shall be completely separated, installed in separate trenches, and there shall be no cross-connection between the systems under any circumstances.

02222.3.5 SPECIAL CONSIDERATIONS FOR HDPE PIPE

02222.3.5.1 HANDLING AND STORAGE – Polyethylene pipe is able to withstand normal installation handling. However, unusually rough handling of polyethylene pipe can result in damage to the pipe wall. Care shall be taken to avoid pushing or pulling polyethylene pipe over or around sharp projections. Polyethylene pipe is subject to impact damage when dropped from excessive heights or when heavy objects are dropped upon it, particularly during cold weather. Kinking or buckling shall be avoided and any section of pipe which has been damaged in this manner shall be cut out and replaced. If a scratch depth is greater than 10% of the pipe wall thickness, then the section shall be removed and replaced.

02222.3.5.2 FUSION JOINT INSPECTION – The field technique for evaluating a butt fusion joint is bead appearance. The recommended procedures should result in the desired appearance. The Contractor shall inspect the entire circumference of the fused joint for uniform non-porous bead alignment. Improper fusion shall be redone. The Contractor shall comply with the Butt Fusion Joint Appearance Guide recommended by the manufacturer.

02222.3.5.3 PIPE PLACEMENT – Polyethylene pipe can be joined either above ground or in the ditch as the situation dictates. Though most joining can be accomplished above ground, joining which must be done in the ditch shall be well planned to ensure that enough space is available and that proper alignment is achieved. Care shall be taken to avoid buckling, gouging, and other mechanical damage when lowering polyethylene pipe into the ditch. The pipe should be laid so that there are no bends with a radius less than 20 times the pipe diameter and no joints within 3 feet of any bends. (90 times the pipe diameter at fusions.)

- Align all pipe and fitting joints true to line and grade. Extremely cold weather makes polyethylene pipe stiffer and increases the likelihood of impact damage.

- Because plastic pipe contracts as it cools, it is desirable in hot weather to snake the pipe in the bottom of the trench. This provides for "slack" in the pipeline to be taken up as the pipe cools and contracts in the ditch prior to backfilling. It is recommended that backfilling be accomplished after the pipe has cooled in the shade of the trench.

02222.3.5.4 HYDROSTATIC LEAK TESTING – Hydrostatic testing of the HDPE pipeline shall be performed on as complete of sections of the installed pipeline as possible and in the presence of the Engineer. Hydrostatic testing procedures shall be as described by "DriscoPlex" Bulletin: PP 802-TN, Test Phase Alternate #1 (www.driscoplex.com). Under no conditions except with the written consent of the Engineer shall pneumatic testing be allowed. Pressure recordings and other testing data shall be kept by the Contractor and supplied to the Engineer upon successful completion of the testing procedures.

02222.3.6 FLUSHING AND CLEANING

02222.3.6.1 FLUSHING WITH WATER - Prior to proceeding with pressure testing (and/or disinfection if required) of completed lines, the Contractor shall fill the test section with clean, potable water and flush the lines. The Contractor shall furnish all equipment and labor to complete the flushing as required by this section. Water for flushing shall be provided by the Owner.

02222.3.6.2 DIFFICULT CONTAMINANTS - Certain contaminants, especially in caked deposits, resist flushing at any velocity. If, in the opinion of the Engineer, such contaminants have entered the line during construction, the interior of the pipe shall be swabbed, as necessary, to remove the debris prior to proceeding with flushing.

02222.3.6.3 MINIMUM FLUSHING FLOW AND VELOCITY - The Contractor shall make all arrangements, to establish a minimum 2.5 feet per second (fps) flow velocity in the line during the flush. Flushing shall proceed until the installed pipe is free of debris. The flows needed to produce the required flushing velocity indicated above are provided in the table below.

FLUSHING FLOW AND VELOCITY

Pipe Diameter (inches)	Flow (gpm) to Produce 2.5 fps
4	100
6	200
8	400
10	600
12	900
16	1600

NOTE: With 40 psi residual pressure, 2 1/2 inch and 4-1/2 inch hydrant outlet nozzles will have the ability to discharge approximately 1,000 GPM and 2,500 GPM respectively.

02222.3.7 TESTING

The Contractor shall perform all testing, and shall furnish all materials, equipment, and labor necessary to complete this work as required. Any work that fails to meet the acceptance criteria of prescribed testing shall be repaired and/or replaced at no additional cost to the owner. All repaired work shall be re-tested. This sequence shall be repeated until the work meets the acceptance criteria.

02222.3.7.1 PRESSURE TESTING - All pipelines constructed for carrying potable, non-potable, and water-borne products shall be pressure tested for leakage when they are completely assembled, unless directed otherwise in these Specifications or in writing by the Engineer.

WARNING - The hydrostatic test procedures described herein are not applicable to air pressure testing.

Prior to pressurization all required flushing shall have been completed. Pipeline sections to be tested shall be isolated from any connecting lines. Air release taps shall be provided at points of highest elevation, the test section shall be filled with clean potable water, and all air shall be removed from the line. Pressure on the test section shall then be brought to full test pressure and maintained at that level for a period of not less than 4 hours. Pipelines shall be tested at 50 psi over normal static pressures shown on the Drawings or to the manufacturer's class rating, whichever is lower. Permanent plugs shall be inserted into the air release tap holes after the test has been completed.

02222.3.7.2 LEAKAGE TESTING - The leakage test shall be conducted concurrent with the pressure test. Testing allowance shall be defined as the maximum quantity of makeup water that is added into a pipeline undergoing hydrostatic pressure testing, or any valved section thereof, in order to maintain pressure within ±5 psi (34.5 kPa) of the specified test pressure (after the pipeline has been filled with water and the air has been expelled*) No pipe installation will be accepted if the quantity of makeup water is greater than that determined by the following formula:

In inch-pound units, $L = SD(P^{0.5})/148{,}000$

where:
L = Testing allowance (makeup water), in gallons per hour
S = Length of pipe tested, in feet
D = Nominal diameter of the pipe, in inches
P = Average test pressure during the hydrostatic test, in pounds per square inch (gauge)

When the allowed amount of leakage is exceeded, leaks shall be located and repaired and the system shall then be re-tested by the Contractor until compliance is achieved.

All visible leaks in exposed pipe shall be repaired.

02222.3.7.3 OPERATIONAL TESTING (*pressurized irrigation only*) - Pressurized irrigation systems shall be tested for proper system operation after backfill is in place and sprinkler heads have been adjusted to final position. This test shall demonstrate that the system meets coverage requirements (based on operation of one circuit at a time) and that all automatic controls function properly.

02222.3.7.4 NON-RIGID PIPE DEFLECTION TESTING - At the Engineer's request, the Contractor shall test requested portions of all non-rigid pipe after being installed and backfilled to ensure that circumferential deflection does not exceed 5% of the diameter. Such test will consist of passing a mandrel through an open section of pipe, sized appropriately to detect non-compliance. The mandrel shall be sized in accordance with the requirements provided in Section 02224 for checking sewer pipe. In the event deflection non-compliance is found, the Contractor shall make repairs as outlined in Section 02224 and additional testing of other sections of pipe will be requested.

02222.3.7.5 TESTING DOCUMENTATION - The Contractor shall maintain a record of all testing performed, together with the test results obtained, for each line installed under this Contract. Minimum information to be included in these records shall be as follows:

- All Documents:
  - Date of issuance of the record
  - Name of Contract
  - Contractor's name and address

- Disinfection Report:
  - Name and address of treatment supervisor
  - Disinfection method used
  - Location and boundary description of section to be disinfected
  - Time and date of disinfectant introduction
  - Time and date of disinfectant release
  - Initial disinfectant residual (PPM) for each outlet tested
  - Time and date of flushing after disinfection
  - Signature of treatment supervisor (signifies completion of disinfection activities)

- Bacteriological Report:
  - Date issued
  - Project name and location
  - Laboratory's name, certification number, address and phone number
  - Test location
  - Time and date of sample collection
  - Name of person collecting sample
  - Time and date of laboratory test start
  - Coliform bacteria test results for each sample
  - Certification that water conforms (or fails to conform) to bacterial standards of the appropriate state public drinking water regulations
  - Bacteriologist's signature

- Test Report:
  - Type of test
  - Location of test
  - Sizes, types, and lengths of pipe in test section, and test boundary description
  - Date and Time test started
  - Date and Time test completed
  - Test pressure (*Pressure Test only*)
  - Amount of leakage/allowable leakage (*Pressure Test only*)
  - Mandrel dimensions(*Obstruction and Non-Rigid Pipe Deflection Tests only*)
  - Test result (*pass/fail*) (*All Tests*)
  - Printed Name/Signature and Date of Test Supervisor (Contractor's representative) (*All Tests*)
  - Printed Name/Signature of Inspector (Engineer's representative) witnessing and approving the test (*All Tests*)

02222.3.8 DISINFECTION

02222.3.8.1 REGULATORY COMPLIANCE - All pipelines to be used for culinary water service shall be disinfected in accordance with the requirements of state and local public drinking water regulations.

02222.3.8.2 METHODS - The Contractor may use any method which complies with the above referenced standards; however, the "slug method", prescribed in ANSI/AWWA C-651, is preferred. This method basically consists of filling the line with potable water and then injecting a "slug" of concentrated chlorine solution (100 mg/L) at the upstream end of the line. The "slug" is then moved through the line by slowly draining the low end. When properly conducted, this procedure provides contact to the interior pipe surfaces with a heavily concentrated dose of chlorine to achieve disinfection.

02222.3.8.3 FLUSHING - After disinfection, the lines shall be flushed until residual chlorine is reduced to the levels safe for consumption. Samples for bacteriological testing can then be taken. The Contractor shall safely and legally dispose of contaminated water used for disinfection after consultation with the local authorities. Under no circumstances shall heavily chlorinated water be allowed to mix with "live" waters, meaning waters in lakes, rivers, streams or wetlands.

02222.3.9 PIPELINE LOCATION IDENTIFIERS

The Contractor shall furnish and install such identifiers as shown on the Drawings and/or prescribed in these Specifications.

02222.3.9.1 TRACER WIRE – Tracer wire shall always be installed in the trench with non-metallic pipelines, during or immediately following their installation and may be required in the installation of metallic pipelines where electric conductance is necessary and is not provided through the pipeline because of its type of construction. Tracer wire placement shall be as shown on the Plans but shall generally be immediately beneath (preferred), to the side, or above the pipeline with approximately 4 inches of separation. Tracer wire shall be brought to the surface of the ground at all valves and risers and where otherwise shown on the plans.

Tracer wire shall be installed as shown in the Plan details. Where splices in the wire are required, the Contractor shall use the manufacturer recommended splice nut (cap) to provide a watertight joint. Extend electrical tape well over the wire insulation in all directions.

The Contractor shall provide all necessary labor, equipment, and materials to perform an electrical continuity test prior to acceptance on all installed tracer wire. The test shall be performed in the presence of the Engineer or an appointed representative. The continuity test shall be conducted using an ohmmeter. Continuity must be demonstrated to pass the test. In the event of a failed test, the Contractor shall make all necessary repairs required to provide a tracer wire system that complies with the testing requirements of this section.

Some soil conditions and/or installation circumstances may require the additional installation of cathodic protection for the tracer wire. When this is the case, cathodic protection will appear as a separate bid item and details for its installation will appear on the Plans and elsewhere in these Specifications.

02222.3.9.2 WARNING TAPE – A continuous ribbon of warning tape shall be installed during the backfill operation. Tape shall be placed a minimum of 12-inches above the top of the pipeline or at a depth approved by the Engineer, or otherwise as shown on the drawings. At roll ends and at places where the tape has been broken, the loose ends shall be tied together to prevent separation during the rest of backfill.

02222.3.9.3 MARKING POSTS – Marking posts shall be installed at the placement intervals shown on the Plans. Posts shall not be deformed or damaged during installation. The Contractor shall use a post hole digger to install markers when there is danger of damage to posts from pounding or hammering

02222.3.10 CLEANUP

Following acceptance of testing and completion of backfilling and surface restoration, the Contractor shall prepare the work for contract closeout in accordance with Section 01200 of these Specifications.

02222.4 METHOD OF MEASUREMENT

02222.4.1 BURIED WATER LINES

The amount of buried water line pipe shall be determined by measuring the lineal feet of pipe in place and accepted, including the lengths of fittings, valves, couplings, and portions of pipe within casings, unless called out otherwise in the Contract Documents.

Measurement of lines passing through or connecting to control valves or other operating devices enclosed in vaults or manholes, shall be made only up to the pay limit of the enclosure or vault as shown on the Drawings. If no pay limit is shown, measurement will be made to a point five (5) feet outside of the enclosure.

Measurement of ductile iron pipe shall include polyethylene encasement where that material is required.

02222.4.2 PIPELINE LOCATION IDENTIFIERS

Measurement of tracer wire and location markers installed with non-metallic pipe shall be included in the measurement of the waterline pipe unless they are separate bid items in which case measurement for tracer wire shall be the same as the length of waterline installed and location markers shall be measured by counting the number of markers installed.

02222.4.3 EXPOSED PIPELINES

Exposed water pipe shall not be measured in connection with the installation of water lines but shall be included in the measurement of the structure or facility where the exposed pipe is located, and payment for such pipe shall be included in the payment for those bid items.

02222.4.4 FITTINGS

Unless specifically called out for separate payment on the Bid Schedule, fittings for pipelines and piping systems will be considered appurtenant to the line or system being installed, and measurement for such fittings will be included in the measurement for that pipeline or piping system.

02222.4.5 MISCELLANEOUS

Separate measurement for valves and vaults and enclosures and their contents will be as described in other sections of these Specifications.

02222.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
(*size*) PVC Pipe (*Class*) [AWWA C-900] or [*Pressure rated*]	Lineal Foot
(*size*) DI Pipe (*Class*)	Lineal Foot
(size) HDPE Pipe [IPS] or [DIPS] C906 SDR (#)	Lineal Foot
(*size*) Galvanized Iron Pipe (*Schedule*)	Lineal Foot
Pipeline Location Markers	Each

No separate payment will be made for fittings unless called for on the Bid Schedule.

02226.1 DESCRIPTION

Includes furnishing all labor, equipment and materials required to install pipe, dispose of unsuitable materials, perform trench backfilling and compaction in conformance with Section 02200 and provide pavement restorations in conformance with Section 02500.

02226.1.1 RELATED WORK

Section 02105 - Earthwork Materials
Section 02200 - Trench Excavation and Backfill
Section 02500 - Removal and Replacement of Surface Improvements

02226.1.2 SUBMITTALS

Submit manufacturer's certification that all material furnished is in compliance with specifications, standard references, and contract requirements in accordance with Section 01300.

02226.1.3 DEFINITIONS

Pipe Zone - The area around the pipe in the trench width and up to 12-inches over the pipe.

Drainage Pipe - Perforated and non-perforated pipe used for collection and transmission of subsurface drainage.

Culvert - Pipe used for transmission of surface water under and around roadways.

02226.2 MATERIALS

The Contractor shall not change pipe size, material or class without written approval from the Engineer. Provide the type, class and size of pipe shown on the Drawings and conforming to the following:

02226.2.1 REINFORCED CONCRETE PIPE

Use Class A or B with Type II cement, which conforms to AASHTO M-170. Elliptical pipe shall be Class A or B, which conforms to AASHTO M-207 with tongue and grove joints.

02226.2.2 CORRUGATED POLYETHYLENE CULVERT PIPE

Corrugated polyethylene culvert pipe shall be Class A or B conforming to the requirements of AASHTO M-294.

02226.2.3 CORRUGATED GALVANIZED STEEL PIPE AND PIPE-ARCH

Corrugated galvanized steel pipe and pipe-arch shall be Class A, B or C, which conforms to the requirements of AASHTO M-36.

02226.2.4 CORRUGATED ALUMINUM PIPE AND PIPE-ARCH

Corrugated aluminum pipe and pipe-arch shall be Class A, B or C, which conforms to the requirements of AASHTO M-196 and M-197.

02226.2.5 PVC DRAIN PIPE

Solid wall and perforated drain pipe with rubber gasketed joints, which conforms to the requirements of ASTM D2729. Perforation shall follow the ASTM D2729 perforation pattern of 2, one-half inch holes 120° apart with 5-inch spacing.

02226.2.6 PE DRAIN PIPE

Corrugated solid wall and perforated drainpipe with rubber gasketed joints, which shall conform to ASTM F405.

02226.2.7 DRAIN GRAVEL

Drain Gravel shall comply with the requirements provided in Section 02105.

02226.2.8 GEOTEXTILE FABRIC

Geotextile Fabric shall be as called for on the Drawings and specified in Section 02950.

02226.3 CONSTRUCTION REQUIREMENTS

02226.3.1 HANDLING AND STORAGE OF PIPE

The Contractor shall handle and store pipe to prevent damage by crushing or piercing and in such a way as to prevent contamination. Any pipe delivered to the Work site, which does not conform to specifications or is scratched, bent, cracked, chipped or otherwise damaged, shall be rejected. The Contractor shall protect pipe and components against dirt and damage during shipment and storage and shall store pipe in strict conformance with the manufacturer's recommendations. The Contractor shall not store PE or PVC plastic pipe in direct sunlight for more than 30 days.

02226.3.2 PREPARATION

The Contractor shall verify location of existing utilities and structures ahead of pipe laying operation. If pipe adjustment is necessary due to location of other utilities, secure approval from Engineer prior to proceeding.

02226.3.3 TRENCHWORK

The Contractor shall excavate trenches in accordance with Section 02200. The Contractor shall repair unstable subgrade for pipe installation by over-excavating to stable soils or a minimum 8-inches depth and replace with approved stabilization material.

02226.3.4 DEWATERING

The Contractor shall keep the pipe trenches free from water during pipe installation by a method acceptable to the Engineer.

The Contractor shall be responsible for damages of any nature resulting from the dewatering operations, notwithstanding approval of the method by the Engineer.

02226.3.5 SHORING

The Contractor shall provide trench shoring and protection in accordance with applicable OSHA standards and Section 01510.

02226.3.6 INSTALLATION

02226.3.6.1 PLACEMENT – Pipe placement shall be as follows:

- The Contractor shall handle and install pipe as per manufacturer's specific instructions.
- The Contractor shall make bellholes and depressions only of such length, depth and width as required for properly accommodating the particular type of pipe joint being installed.
- The Contractor shall join pipe in accordance with manufacturer's recommendation or as specified in piping specification section.
- Pipelines shall be laid on uniform grades.
- Do not install pipe at a grade less than 0.5%.
- Lay gravity flow pipe upgrade beginning at lower end.
- Pipe shall not be installed without continuous support under the barrel.
- The Contractor shall obtain written approval from the Engineer to deflect pipe from true line and grade. Do not exceed deflection allowed by pipe manufacturer's recommendation.
- The Contractor shall not lay pipe in water or when trench conditions or weather are unsuitable for such work.
- The Contractor shall place circular concrete pipe which contains elliptical reinforcing so that the reference lines designating the top of the pipes will not be more than 5° from the vertical plane through the longitudinal axis of the pipe.
- Not more than 300 feet of continuous pipe placement will be allowed without the installation of an inlet box, catch basin, combination box, clean-out box, manhole or other such structure.

02226.3.6.2 CUTTING TOOL - The Contractor shall use an approved machine or cutting tool recommended by the pipe manufacturer to cut pipe.

02226.3.6.3 DAMAGED PIPE - The Contractor shall remove and relay any section of pipe already placed which is found to be out of alignment, defective or damaged.

02226.3.6.4 PLUGS - The Contractor shall provide plugs for pipeline branches, stubs or other open ends, which are not to be immediately connected. The Contractor shall use a joint comparable to the main line joints and thrust block as required to secure plugs.

02226.3.6.5 GALVANIZED PIPE - The Contractor shall provide protection to galvanized pipe to prevent scratches or abrasion and assure that the coating is not damaged. Remove and replace damaged pipe sections when directed by the Engineer. Provide proper facilities for lowering sections of pipe into trenches.

02226.3.6.6 CONNECTION TO CONCRETE - The Contractor shall form, size and finish structures connecting piping in accordance with the details of the Drawings and Section 03100. The Contractor shall install mortar in joints at catch basins, clean-outs, manholes, etc. Remove all loose material and soil from the surface on which concrete will be placed. Non-metallic pipe shall be thoroughly wetted prior to pouring the collars.

02226.3.6.7 PIPE BEDDING - Unless otherwise shown on these Contract Documents, culverts shall be bedded with on site bedding materials or imported bedding, which conforms to Section 02105. Drainage piping shall be bedded in accordance with the details shown on the Drawings with material which also conforms to Section 02105.

02226.3.6.8 BACKFILL - The Contractor shall compact trench backfill in accordance with the requirements of Section 02200 and 02222.

02226.3.7 INSPECTION

Prior to starting backfill of trenches, the Contractor shall notify the Engineer of completion of pipe laying and allow the Engineer to check all installed drain piping and culverts. When access to installed pipe is determined necessary for checking by the Engineer, the Contractor shall open any covering as requested. If defects are found, the Contractor shall make the necessary corrections at no cost to the Owner. If no defects are found, the cost of uncovering and recovering shall be an additional expense covered by the Owner in accordance with the General Conditions (Section 00700).

02226.4 METHOD OF MEASUREMENT

02226.4.1 PIPE AND CULVERTS

Measurement of drainage piping and culverts shall be made by using a tape measure or other accurate measuring device to determine the number of lineal feet of pipe or culvert, along the centerline of the pipe, installed and accepted. This measurement shall include the lengths of all in-line fittings and shall stand as the measurement of all other work involved with the pipe installation such as trenching, backfilling, and site restoration as required.

02226.4.2 ENTRANCE AND EXIT STRUCTURES

Measurement of culvert or drainage pipe entrance and exit structures and measurement of culvert end sections shall be separate from the lineal measurement of the pipe and shall be made by counting the number of such structures built and accepted.

02226.4.3 OTHER WORK AND MATERIALS

The method of measurement for other work and materials such as drain rock, geotextile fabric, and import bedding and backfill will be described separately when called for on the Drawings, in these Specifications, or required by the Engineer.

02226.4.4 DEWATERING

Dewatering of trenches is considered incidental to the construction. The Contractor shall include all associated costs for trench dewatering in the lump sum contract price.

02226.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
(Diameter, Type) Culvert Pipe	Lineal Foot
(Diameter, Type) Drain Pipe	Lineal Foot
Entrance/Exit Structures	Each
Culvert End Section	Each

Payment for other materials, (i.e., drain rock, imported bedding and backfill, geotextile fabrics, etc.) will be made in accordance with their respective specification requirement.

02250.1 DESCRIPTION

This section describes the construction and installation of clay cutoff walls in trench excavations to inhibit the movement of groundwater and/or to prevent the drainage of wetlands or other surface water features following backfill.

02250.1.1 RELATED WORK

Not Used.

02250.1.2 DEFINITIONS

Not Used.

02250.2 MATERIALS

Clay used for construction of the clay cutoff wall shall be "pit run bentonite" and shall exhibit a permeability of $1X10^{-6}$ cm/sec.

02250.3 CONSTRUCTION REQUIREMENTS

The Contractor shall furnish and install clay cutoff wall for backfill in trenches where influenced by groundwater. The clay cutoff wall shall act as a flow curtain to stop groundwater piping in trenches and along pipelines.

02250.3.1 INSTALLATION

Clay cutoff wall shall be installed the total trench width from the bottom of the trench to 2 feet above groundwater static level or finished grade, whichever is lower. Clay cutoff walls shall be a minimum of 3 feet thick. Clay cutoff walls shall be constructed at each end of the water bearing portion of a trench excavation and at intermediate intervals not to exceed 400 feet where groundwater exists

02250.3.2 COMPACTION

Material shall be compacted to 90% maximum density. Proctors shall be taken for materials used, furnished by the Contractor's independent geotechnical testing laboratory, or by the supplier of approved clay.

02250.3.3 PIPE BEDDING

Clay shall be used to bed pipe, and shall be installed as specified herein for "pipe bedding".

02250.3.4 FINISH

Finished grade and surface improvements over clay cutoff walls shall be as specified herein and shown on the drawings.

02250.4 METHOD OF MEASUREMENT

Measurement for this bid item shall be made by counting the number of completed and accepted clay cutoff walls installed in the project.

02250.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAYMENT ITEM	UNIT
Clay Cutoff Wall	Each

CASING PIPE INSTALLATION BY OPEN TRENCH — SECTION 02320

02320.1 DESCRIPTION

This section covers the installation of casing pipe where the casing pipe is required for safety or other reasons but may be installed by open trench excavation.

02320.1.1 RELATED WORK

Section 01300 - Submittals
Section 01510 - Protection of Existing Properties
Section 02105 - Earthwork Materials
Section 02200 - Trench Excavation and Backfill
Section 02222 - Water Pipe Installation
Section 02224 - Sewer Pipe and Manhole Installation

02320.1.2 SUBMITTALS

Prior to commencing any operations, the Contractor shall submit a complete list of all materials to be used in the work, in accordance with Section 01300. The submittal shall include detailed descriptions and/or drawings which show the casing pipe, casing spacers, and method of installing the carrier pipe.

02320.1.3 DEFINITIONS

Casing Pipe - the pipe which is installed to provide a conduit for installation of the carrier pipe within.

Carrier Pipe - the pipe installed inside the casing pipe.

Spacers - the devices used to align and support the carrier pipe inside the casing during its placement and when the placement is complete.

02320.2 MATERIALS

02320.2.1 CASING PIPE

Casing pipe to be installed in open trenches shall be corrosion resistant concrete, PE, PVC or galvanized steel pipe of the size, class and configuration shown on the Drawings, or prescribed in the Special Provisions.

02320.2.2 CARRIER PIPING

Pipe installed in casing pipe shall be of the size, type and configuration shown on the Drawings, and/or prescribed in the Special Provisions. Mechanical restraints, suitable with the type of joints required for the carrier pipe, shall be provided with the carrier pipe.

02320.2.3 CASING SPACERS

Casing spacers shall be commercially available spacers such as are supplied by Advance Products & Systems of Lafayette, Louisiana, Cascade Waterworks Manufacturing Company of Yorkville, Illinois, or approved equal. Unless required otherwise in the Contract Documents, casing spacers shall be manufactured of stainless steel with polymer bearing surfaces on the runners. They shall be with a bolt-on design with a two piece shell, and shall be installed in accordance with manufacturer's instructions.

02320.2.4 SAND

When called for to be installed in the annular space around the carrier pipe, sand shall be clean and free of lumps, with 100 percent passing a standard No. 30 sieve.

02320.2.5 CONCRETE

Shall be Class 2000 as described in Section 3050 when used as encasement and Class 3500 when used as entrance or exit protective structures to any encasement.

02320.2.6 CONCRETE REINFORCEMENT

Shall be materials conforming to, and placed in accordance with. Section 03200 and the details shown on the Drawings.

02320.2.7 CAPPING MATERIAL

Temporary casing pipe plugs or end caps may be fabricated from 3/4 inch (minimum) C-DX plywood treated for exterior use, or other suitable material as allowed by the Engineer.

02320.2.8 END SEALS

Carrier pipe to casing pipe end seals shall be installed on both ends of the casing and shall be appropriately sized for the application. Seals shall be as manufactured by Pipeline Seal & Insulator, Inc., or approved equal. Seals shall be of synthetic rubber with stainless steel bands and clamps, suitable for permanent installation in the ground.

02320.3 CONSTRUCTION REQUIREMENTS

02320.3.1 GENERAL

The Contractor shall furnish all materials and labor to place a casing pipe underground and install pipelines in such casing in accordance with the Contract Documents. The casing pipe will be installed by open trenching as prescribed in the Contract Documents and/or approved by the Engineer.

02320.3.1.1 NOTIFICATION AND VISUAL INSPECTION - At least 3 days notice shall be given to the Engineer prior to the start of any casing pipe installation.

02320.3.1.2 REGULATORY COMPLIANCE - The Contractor shall comply with the requirements of any affected public agency, railway company, utility company or other applicable affected agency responsible for public safety or improvements which might be endangered by the casing installation

02320.3.1.3 TRAFFIC CONTROL - In the event that the Contractor is not ready to install the carrier pipe and its appurtenances at the time of completion of installation of the casing pipe, and the operation is inhibiting roadway traffic flow, the earth face at the entrance and terminal shall be supported with bulkheads and the approach trenches will be backfilled. Temporary surfacing shall be placed thereon and the affected portion of the street will then be reopened to traffic. Approach trenches in public streets shall not be permitted to remain open for extended periods of time.

02320.3.2 INSTALLATION

02320.3.2.1 EXCAVATION - The Contractor shall prepare the bed for the casing pipe by excavating in to the lines and grades shown on the Drawings in accordance with Section 02200. Laying of the casing pipe shall then be made in accordance with Section 02222 or 02224 as applicable according to the type of pipe required.

02320.3.2.2 CASING PIPE - The casing pipe shall be completely installed and backfilled, unless directed otherwise by the Engineer, before installation of the carrier pipe is started. It shall be the Contractor's responsibility to obtain the required alignment and grade for the carrier pipe and to ensure that the carrier pipe does not rest on the casing bottom.

When the ends of plastic casing pipe are left exposed for future insertion of carrier pipe, galvanized corrugated steel pipe of the appropriate diameter shall be slid over the end of the carrier pipe. The galvanized pipe shall be of sufficient length to cover the end of the plastic casing to a minimum of one foot and to extended from the end of the casing to daylight from beneath the earth cover.

02320.3.2.3 PROTECTION OF CASING PIPE - The Contractor shall protect and preserve the interior surfaces of the casing pipe from damage. As required by the Engineer, the Contractor shall provide and install temporary plugs or end caps on casing pipe to prevent the entrance of insects, animals, water, rock, dirt, or other deleterious material during the time casing pipe ends are left exposed while other work is being done.

02320.3.2.4 END SEALS – As shown on the Drawings and/or required in the Special Provisions, the Contractor shall furnish and install permanent, casing pipe to carrier pipe end seals. The Contractor shall coordinate this work to assure that seals are appropriately installed as the carrier pipe is placed in the casing pipe and before any backfill operations are started.

02320.3.2.5 CONCRETE ENCASEMENT - When encasement in concrete is required, the Contractor shall set the carrier pipe in place in compliance with the Drawings and then form and place concrete encasement in accordance with the Drawings and with Sections 03050, 03100 and 03200 in these Specifications.

02320.3.2.6 CARRIER PIPE - Upon completion of the encasement, the Contractor shall proceed with installation and cleanup of the lines connecting the carrier pipe

Mechanical restraint shall be installed on every joint of rubber gasket (slip) jointed carrier pipe installed in the casing pipe.

The carrier pipe MUST be installed in the casing in such a manner that sufficient carrier pipe extends from each end of the casing pipe to allow for appropriate joining and so as not to interfere with other work such as filling of the annular space. For this purpose, the Contractor shall leave a minimum of 5 feet of carrier pipe exposed at each end of the casing or as otherwise directed by the Engineer.

Testing of that part of the carrier pipe to be encased shall be made at the same time as testing of contiguous portions of the carrier pipe. Testing shall conform to testing requirements stated in Sections 02222 and 02224 as appropriate. For concrete encasement, testing of the carrier pipe shall take place prior to the concrete being placed. For pipe encasement, testing shall be completed prior to the filling of the annular space between the casing and carrier pipe with sand.

After the carrier pipe has been tested and accepted, end seals or other approved covers shall be installed over the ends of the casing pipe to prevent foreign materials from entering the casing while backfilling takes place.

02320.3.2.7 FILLING OF ANNULAR SPACE - When required for pipe encasement, the Contractor shall furnish all necessary sand, equipment, hoses, valves, fittings and labor to backfill the annular space in the casing with sand after the carrier pipe has been installed. Sand shall be conveyed by air pressure through a hose and deposited in its final position in such a manner as to completely fill all voids. This work will be considered completed when no more sand can be forced into the annular space.

02320.4 METHOD OF MEASUREMENT

02320.4.1 METAL PIPE ENCASEMENT

The amount of casing pipe required shall be as shown on the drawings or prescribed elsewhere in the Contract Documents. However, casing pipe installation is not a "Lump Sum" item, and, in the event the actual quantities required differ from the amount shown, the difference in lineal feet, either more or less, shall be determined using a tape measure or other accurate measuring device and the Contractor paid according to the unit price on the Bid Schedule. The measurement for casing pipe shall include all other work and materials required to install the casing pipe and the carrier pipe within, such as all excavation including but not limited to boring and catch pits, carrier pipe spacers, sand, concrete, backfill, bulkheads, equipment and site clean-up together with all other materials and labor required for accepted installation. Measurement for pipe encasement includes backfilling of road sections to the top of the sub-grade.

02320.4.2 CONCRETE ENCASEMENT

Measurement of Concrete Pipe Encasement will be made by counting the number of cubic yards of concrete placed to encase the carrier pipe as required, and shall include forming, reinforcement, insertion of carrier pipe, and excavation and backfill of the trench. Measurement for concrete encasement includes backfilling of road sections to the top of the sub-grade.

02320.4.3 SEPARATE MEASUREMENTS

Measurement for payment of the length of carrier pipe within the encasement shall be separate from and in addition to measurement of the encasement. Measurement of base gravel and surfacing materials will be separate and according to bid items for those materials.

02320.5 BASIS OF PAYMENT

The accepted quantity will be paid for at the contract unit price for:

PAY ITEM	UNIT
Piped Encasement (casing size and type)	Lineal Foot
Concrete Pipe Encasement	Cubic Yard

Separate payment for furnishing and installing the carrier pipe shall be made under other bid items.

02500.1 DESCRIPTION

This work includes removal and restoration of existing features, public or private, including but not limited to asphalt or concrete pavement, concrete structures, curb and gutter, sidewalk, gravel surfacing, driveways, crosswalks, landscaping, field crops, irrigation ditches, fences, culverts, buried or exposed utilities, abandoned utilities, small utility buildings and the disposal of resulting waste materials and debris.

02500.1.1 RELATED WORK

Section 01510 - Protection of Existing Properties
Section 02015 - Clearing and Grubbing
Section 02200 - Trench Excavation and Backfill
Section 02511 - Hot Plant Mix Bituminous Surfacing
Section 02520 - Pavement Cutting
Section 02900 - Landscaping

02500.1.2 SUBMITTALS

When any improvement not owned by the Owner is designated for restoration work, then, upon completion of such restoration, the Contractor shall obtain a written statement of acceptance or release from the responsible owner of the feature. This statement, in turn, will be submitted to the Engineer for his review and approval prior to acceptance of the work for payment.

02500.1.3 DEFINITIONS

Not used.

02500.2 MATERIALS

02500.2.1 GENERAL

When restoration of a feature is indicated in the Contract Documents, such work shall be accomplished so as to restore the feature to its original, or better, condition and/or function as it existed prior to removal.

It is recognized that exact duplication of materials cannot always be achieved, but reasonable effort is expected from the Contractor to restore the feature with materials which will provide the same or better service and appearance as observed prior to removal.

All materials shall be new.

02500.2.2 BITUMINOUS SURFACE

02500.2.2.1 PRIMER OR TACKER COAT – Shall be an approved bituminous material such as type MC-70-250, SS1, or CS-1.

02500.2.2.2 PATCHING AND REPAIR - Plant mix material that meets or exceeds the requirements of Section 02511 herein, or of the local State Department of Transportation for asphalt surface road repair, shall be used for patching and repair.

02500.2.2.3 SURFACING – Shall be hot or cold mix bituminous surfacing, meeting or exceeding the requirements of Sections 02511 or 02512 herein, or of the local State Department of Transportation for asphalt surface road repair.

02500.3 CONSTRUCTION REQUIREMENTS

02500.3.1 UNCLASSIFIED REMOVAL AND RESTORATION

02500.3.1.1 EXISTING IMPROVEMENTS - All existing facilities disturbed by the Contractor in prosecution of the Work, including but not limited to asphalt or concrete pavement, concrete structures, curb and gutter, sidewalk, gravel surfacing, driveways, crosswalks, landscaping, field crops, irrigation ditches, fences, culverts, buried or exposed utilities, abandoned utilities, small utility buildings or any other structures or obstructions designated to be removed on the Drawings, by the Engineer, or these Specifications, shall be removed, cleaned up, and then restored or replaced in kind by the Contractor in new condition.

02500.3.1.2 ADJACENT IMPROVEMENTS - Care shall be exercised in such removal to assure that adjacent facilities or structures, which are to remain, are not disturbed. Any damage to such existing facilities or structures resulting from carelessness or negligence on the Contractor's part shall be satisfactorily restored to new condition at the Contractor's expense.

02500.3.1.3 VEGETATION - Trees, shrubs, and other landscape plants designated to be saved for replanting shall be carefully removed, bundled, set aside and protected for replanting by the Contractor. Turf Sod to be saved for replanting shall be removed by machine cutting. In lieu of removal and replacement of turf sod or field crops, the Contractor may, upon approval of the property owner, remove and replant the same. Such agreements shall be documented on the final property release to be signed by the property owner.

Replanting of landscape items shall be performed in accordance with Section 2900.

02500.3.2 TOPSOIL

02500.3.2.1 REMOVAL AND PROTECTION - In all construction areas where re-growth of vegetation is desired, and when called for by the Contract Documents, the Contractor shall remove, segregate, stockpile, store, and protect topsoil during excavation in accordance with Section 02900. Topsoil shall be kept free from contamination from foreign materials and other soils. The Contractor shall arrange construction activities to avoid damage or disturbance to the stockpiled soil.

02500.3.2.2 REPLACEMENT - When backfill operations have been completed, the topsoil shall be replaced and restored to the original contours or as called for on the Drawings, in accordance with Section 2900 of these Specifications.

02500.3.3 GRAVEL SURFACE

02500.3.3.1 REMOVAL - When restoration of graveled driveways, roadways, or parking areas is required, the existing gravel surfacing shall be graded off and stockpiled safely away from ongoing work activities, to prevent contamination with subsurface materials. It may then be reapplied and compacted during restoration activities.

02500.3.3.2 RESTORATION - Areas to be restored shall be backfilled and graded to uniform lines and compacted to the density prescribed for trenching in Section 02200. Existing gravel surfacing materials shall then be replaced in uniform 3 inch layers compacted to 95% of maximum density. After compaction, the affected area shall be graded smooth. Sufficient new material of equal or better quality shall be applied and mixed in, to replace materials lost during prosecution of the Work, to ensure a 3-inch minimum gravel cover after compaction and grading.

02500.3.4 BITUMINOUS SURFACE

02500.3.4.1 REMOVAL - Bituminous pavement surface shall be removed and restored in accordance with this paragraph unless provisions for restoration are made in other Sections of these Specifications. The pavement surface, public or private, designated for removal shall be removed to neat lines, which shall be cut in accordance with Section 02520. No ripping or rooting will be permitted outside of the limits of the cut lines.

Existing driveways, sidewalks, etc., which do not match the new finish grade as shown on the Drawings, also shall be removed preparatory to restoration work.

02500.3.4.2 DISPOSAL - Surfacing materials removed shall be disposed of in accordance with Section 1520 of these Specifications, and will not be permitted in the backfill, except as specifically authorized by the Engineer and in accordance with local requirements.

02500.3.4.3 RESTORATION – Restoration of bituminous surface shall proceed according to the following steps:

- First, the sub-grade shall be graded to a uniform surface, and 6 inches of Untreated Base Coarse (UBC) gravel shall be placed over the area in lifts not thicker than 3 inches, compacted to 95% of its maximum density.

- Then, the exposed edges of existing pavement shall be primed with a material approved for this purpose.

- Unless shown otherwise on the drawings or required otherwise by the Engineer, hot or cold mix bituminous surfacing shall be spread and compacted in individual, 3-inch maximum lifts over the base course. Minimum thickness of the new bituminous surfacing layer shall be equal to the adjacent surface thickness, but shall be not less than 3 inches thick when compacted to 95% of its maximum density.

- Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller. The surface shall be finished to a smooth, uniform line and grade with surface deviations not exceeding plus or minus 1/4 inch in 10 feet, unless the surface is subject to more stringent State, County, or Municipal requirements. The determination of smoothness compliance may be made with a straight edge or string line at the option of the Engineer. Any irregularities shall be satisfactorily corrected at the sole expense of the Contractor.

- Existing driveways, sidewalks, etc., which were removed because they did not match the new finish grade, shall be replaced and restored to their original or better condition to match the new finish grade shown on the Drawings, or as directed by the Engineer.

02500.3.5 REMOVAL AND RESTORATION OF CONCRETE IMPROVEMENTS.

02500.3.5.1 REMOVAL - Existing concrete pavement in streets, alleys, driveways, sidewalks, etc., public or private, shall be cut in accordance with Section 02520, and removed to the lines indicated on the Drawings, or as directed by the Engineer. No ripping or rooting will be permitted outside of the limits of saw cut lines.

Existing driveways, sidewalks, etc., which do not match the new finish grade as shown on the Drawings, also shall be removed preparatory to restoration work.

02500.3.5.2 DISPOSAL - All materials removed shall be disposed of in accordance with Section 1520 of these Specifications, and will not be permitted in the backfill, except as specifically authorized by the Engineer and in accordance with local codes.

02500.3.5.3 RESTORATION - Sub surface preparations shall be the same as those in paragraph 02500.3.4.3 above.

- Concrete pavement including sidewalks, driveways, roadways, and parking area surfacing shall be replaced by the Contractor in accordance with Division 3 of these Specifications, unless otherwise directed by the Engineer

- Those existing driveways, sidewalks, etc., which were removed because they did not match the new finish grade, shall be replaced and restored to their original or better condition to match the new finish grade shown on the Drawings, or as directed by the Engineer.

- All other concrete improvements shall be restored in accordance with details shown on the Drawings, or as directed by the Engineer, and as required by the provisions of Division 3 of these Specifications.

02500.3.6 REMOVAL AND RESTORATION OF FENCES

When necessary to remove any fence to facilitate its operation, the Contractor shall obtain prior agreement with the owner of the fence for its removal. Temporary containment measures shall be provided, if needed, at no additional expense to the Owner. As soon as practical, the permanent fence shall be restored to its original condition or better.

02500.3.7 RESTORATION OF IRRIGATION DITCHES

Restoration of irrigation ditches shall be made in such a manner that the ditch configuration and size will be equivalent to its original condition and the ditch will be located on its original alignment. Any embankment required to restore the original slope of the ditch will be layer compacted with mechanical compaction equipment to 90% of maximum dry density determined by AASHTO T-99.

02500.3.8 CLEANUP

Areas of construction activity shall be left in a condition of uniform grade, blending into pre-existing contours and concealing, as much as possible, evidence of construction activity by back dragging or raking to conceal tire marks. Cleanup and disposal of surplus materials shall be performed in accordance with Section 1520.

02500.4 METHOD OF MEASUREMENT

02500.4.1 NO BID SCHEDULE LINE ITEM

When the Bid Schedule in the Contract does not contain a line item for "Removal and/or Restoration of Surface Improvements", then this work will be considered incidental to other items included in the Bid Schedule, and no separate measurement shall be made for this work.

02500.4.2 “DESIGNATED AREA” LINE ITEM

Measurement for removal and/or of surface improvements in a designated area shall be the "lump sum" of the work required to remove and properly dispose of materials resulting from removal.

02500.4.3 “DESIGNATED FEATURE” LINE ITEM

Measurement for removal and/or restoration of designated features shall be per unit as described in the Bid Schedule.

02500.4.4 BITUMINOUS SURFACE PAY LIMIT

Measurement for bituminous surface removal and replacement shall be made by multiplying the pay limit by the actual length of removal and replacement in lineal feet as determined using a tape measure or other accurate measuring device.

In general, for pipe trench excavation, the pay limit shall be determined by the formula W = OD + 18 inches (pay limit width equals pipe outside diameter plus 18 inches), rounded up to the nearest standard bucket width. Actual measurement may be modified according to information indicated on the Drawings or as directed by the Engineer.

The pay limit for removal of bituminous surface for other purposes shall be as shown on the Drawings or directed by the Engineer.

02500.4.5 DAMAGED ITEMS

Measurement of items damaged or removed as a result of the Contractor's negligence shall not be allowed and no payment will be made under this contract.

02500.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit prices as follows:

PAY ITEM	UNIT
Removal of Site Surface Improvements	Lump Sum
Removal of (*Name of Structures*)	Each
Removal of Sidewalk	Square Yard
Removal of Fences	Lineal Foot
Removal of Driveway Slabs	Square Yard
Removal of Curb and Gutter	Lineal Foot
Removal of Bituminous Surface	Square Yard
Replace (*Name of Structure*)	Each
Replace (*Thickness*) Sidewalks	Square Yard
Replace (*Thickness*) Driveway Slabs	Square Yard
Replace *(Thickness)* Bituminous Surface	Square Yard
Replace (*Description*) Fence	Lineal Foot
Replace (*Description*	Lineal Foot or Lump sum
Restore (*Description*)	Lineal Foot or Lump Sum

02510.1 DESCRIPTION

This section covers all sampling and testing of subgrade and pavement materials. The materials sampling and testing shall be done by an independent certified testing company and all testing reports shall be submitted to the Engineer within a reasonable time period.

02510.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 02200 – Trench Excavation and Backfill
Section 03050 – Portland Cement Concrete

02510.1.2 SUBMITTALS

All sampling and test reports shall be submitted in accordance with Section 01300.

02510.1.3 DEFINITIONS

Not used.

02510.2 MATERIALS

Not used.

02510.3 CONSTRUCTION REQUIREMENTS

02510.3.1 TESTING

The minimum testing requirements are as follows: All Materials sampling and testing shall be done by an independent certified testing company and all testing reports shall be submitted to the Engineer within a (2) two week time period or sooner.

02510.3.1.1 EMBANKMENT

• Maximum Laboratory Density	1 test in each soil type
• Field Density and Moisture	1 test per 2000 square yards

02510.3.1.2 BACKFILL

• Field Density and Moisture	2 tests per culvert or structure (Refer to Section 02200 for Trench Excavation and Backfill Testing)

02510.3.1.3 UNTREATED BASE COURSE

• Sieve Analysis	1 test per production day
• Maximum Laboratory Density	1 test per 10,000 tons
• Field Density and Moisture	1 test per 2000 square yards

02510.3.1.4 ASPHALT CONCRETE PAVEMENT

• Mix design (ASTM 1559 and AASHTO T-283)	1 mix design for the project
• Asphalt temperature	As necessary to assure compliance
• Gradation and Asphalt Content	2 tests per production day
• Field Density	1 test per 1600 square yards

- Mix and Laydown Temperature — As necessary to assure compliance
- Thickness — 1 test per 1600 square yards

02510.3.1.5 PORTLAND CEMENT CONCRETE

- Slump Test — 1 test per load of concrete
- Air Test — 1 test per load of concrete
- Strength Test — 1 compressive strength per 50 cubic yards

02510.4 METHOD OF MEASURMENT

Measurement for this pay item will be by the lump sum.

02510.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price:

PAY ITEM	UNIT
Materials Sampling and Testing	Lump Sum

02511.1 DESCRIPTION

Includes manufacturing, transporting, laying and compacting hot mixtures of bituminous surfacing for roads, parking areas, sidewalks and other traffic surfaces.

02511.1.1 RELATED WORK

Section 02500 – Removal and Replacement of Surface Improvements
Section 02513 - Asphalt Tack Coat

02511.1.2 SUBMITTALS

02511.1.2.1 MIX DESIGN - The Contractor shall develop and submit proposed mix-designs based on the Marshall Method for Hot Asphalt Paving Mixtures as established in AASHTO T 245. The submittal shall include a laboratory report incorporating all of the information required by that specification, together with curves developed from the mix designs showing varying percentages of asphalt by dry weight of mix versus unit weight, percent air voids, stability, flow and percent voids in mineral aggregate.

02511.1.2.2 JOB MIX FORMULA – At least 15 days prior to producing bituminous mixtures, the Contractor shall submit to the Engineer, in writing, a proposed job-mix formula for each mixture for use in setting the job-mix formula to be used with the proposed materials. For bituminous mixtures, the proposed job-mix formula shall be based on a mix-design-run on aggregates, crushed or otherwise, produced for the project and using the bituminous material that will be furnished for the project.

Each job-mix formula shall propose definite single values (hereafter referred to as Target Values or TV) for:

- The percentage of aggregate passing each specified sieve based on the dry weight of aggregate. These percentages shall be within the range shown in Table 2-H.
- The percentage of bituminous material to be added based on the total weight of mixture.
- The temperature of the mixture as it leaves the mixer.
- The temperature of the mixture placed on the road immediately preceding initial compaction of the mixture.
- The kind and percentage of additives to be used (Hydrated lime may be added to prevent stripping).
- The kind and percentage of mineral filler to be used.
- The percentage of water, based on the total dry weight of mixture.
- The maximum specific gravity of dense graded hot mix bituminous paving mixtures as determined by AASHTO T 209 (For open graded hot mixes, the laboratory density developed during mix design shall be used as the TV. It shall be the maximum density for the TV bituminous content).
- The mixture shall have a minimum dry retained strength value of 200 psi.

After reviewing the Contractor's proposed job-mix formula, the Engineer shall determine a job-mix formula with single values for the nine parameters listed above, and so notify the Contractor in writing.

Should a change in source of material be proposed, or should a job-mix formula prove unsatisfactory, the Contractor shall establish a new job-mix formula and shall submit same to the Engineer.

02511.1.2.3 PENETRATION/VISCOSITY/TEMPERATURE RELATIONSHIPS - The Contractor shall submit penetration/viscosity/temperature relationships for the bituminous material to be used in the Work along with a certification from the supplier attesting to their accuracy. If the supplier finds it desirable or necessary to change crudes or blends of crudes, new relationships must be supplied along with a sample to use in running a new mix-design. This submittal shall be made not less than 15 days prior to delivery of material from the changed source of materials. The penetration and viscosity values shall be determined at the temperatures and by the procedures specified in AASHTO M 226.

02511.1.3 DEFINITIONS

Plant - Stationary machinery used for manufacturing mixtures of asphalt cement, liquid asphalt with aggregate to form a uniform mixture of bituminous surfacing. Sometimes referred to as "batch plant".

Aggregate - Crushed stone, gravel or slag with uniform particle sizes.

Gradation - A group of particle size limits that are prescribed for aggregate.

Job-Mix Gradation - A gradation of aggregate which has been developed by a contractor or material supplier which can consistently be produced from a given source.

Job-Mix Formula - A mixture of asphalt materials and aggregate which can be consistently produced from a given source with the available plant of a contractor or material supplier.

Course - A single layer of bituminous surfacing.

Mat - Single or multiple layers of bituminous surfacing which have been placed.

Lot - The amount of bituminous mixture placed during a production day.

02511.2 MATERIALS

02511.2.1 ASPHALT CEMENT

Shall meet the requirements of AASHTO M 20 for penetration-graded asphalt cement and AASHTO M 226 for viscosity-graded asphalt cement. When not shown otherwise, the Contractor shall use viscosity grade AC-20 asphalt cement for the bituminous mixture.

02511.2.2 AGGREGATES

Aggregates for hot bituminous mixtures shall be crushed stone, slag or gravel meeting the quality and gradation requirements shown below in Tables 1-H and 2-H, unless shown otherwise in the Contract Documents.

When crushed gravel is used, at least 50 percent by weight of the particles retained on the Number 4 sieve shall have at least one mechanically fractured face.

TABLE 1-H CRUSHED AGGREGATE QUALITY REQUIREMENTS FOR HOT BITUMINOUS PAVEMENT.

Description	AASHTO Test Method	Requirements
Percent Wear	T 96	40 max.
Durability Index, Coarse and Fine	T 210	35 min.
Sand Equivalent (Alternative Method Number 2)	T176	45 min
Stripping Test	T 182	Min. 95% coated**

** An approved chemical additive may be used to meet this requirement.

TABLE 2-H GRADATION LIMITS FOR CRUSHED AGGREGATE USED IN HOT BITUMINOUS SURFACING.

Sieve Size	Percent of Total Aggregate (dry weight)			
	1-inch (1)	¾-inch (2) (Non-rutting)	¾-inch (3)	½-inch (4)
1 inch	100			
¾ inch		100	100	
½ inch	75-91	74-99		100
3/8 inch		69-91	75-91	
No. 4	47-61	49-65	46-62	60-80
No. 8		33-47		
No. 16	23-33	21-35	22-34	28-42
No. 50	12-22	6-18	11-23	11-23
No. 200	5-9	2-6	5-9	5-9

When aggregate is produced and/or stockpiled in more than one size, the blend of sizes shall be based on results of mix design properties that yield the most ideal results. The blended gradations; however, must stay within the gradation limits given herein.

02511.3 CONSTRUCTION REQUIREMENTS

02511.3.1 BITUMINOUS SURFACE MIXING, PLACEMENT, AND FINISHING

02511.3.1.1 PLANT DESIGN AND EQUIPMENT - Plants shall be specifically designed and manufactured to produce a uniform bituminous mixture. The plant shall be capable of controlling and accurately proportioning both aggregates and asphalt cement. Automatic controls shall be provided to shut down the plant when a supply of aggregate or bituminous material is not available.

The plant shall be equipped with appropriate dust collectors and/or control equipment, which enable operation of the plant to meet local and State environmental and health requirements. Liquids from a wet scrubber, when used, shall not be discharged into live streams, lakes or ponds. Effluent from such equipment shall be collected and deposited according to applicable State and local requirements.

Thermometers shall be installed in the plant to accurately indicate the temperature of the bitumen at the charging value in the mixer unit and at the discharge chute of the mixer unit.

Accurate weight measurement of ingredients is essential. Bituminous mix plants shall have associated weight measurement equipment (scales, etc.) with an incremental accuracy of not more than 10 pounds to weigh materials.

02511.3.1.2 MIXING - The aggregates, bituminous material, additives, mineral filler and water shall be measured or gauged and introduced into the mixer in the amount specified by the job mix formula. The bituminous material shall be evenly heated to the specified temperature. A continuous supply of the bituminous material shall be fed to the mixer at a uniform temperature. The temperatures of asphalt cement delivered to the mixer shall be sufficient to achieve a kinematic viscosity of 150 to 300 centistokes.

Aggregate for pugmill mixing shall be heated, dried, and delivered to the mixing unit at a temperature within $\pm$30°F of the temperature of the bitumen, temperature not to exceed 325 degrees F. Moisture content of the aggregate shall not exceed 1 percent at the time it is introduced into the mixing unit. Flames used for drying and heating shall be properly adjusted to avoid damage to, and soot formation on, the aggregate.

After the required amounts of all materials have been introduced into the mixer, the ingredients shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the bituminous material throughout the aggregate have been obtained.

02511.3.1.3 HAULING - Trucks used for hauling bituminous mixtures shall have tight, clean, smooth metal beds that have been thinly coated with a material to prevent the mixture from adhering to the beds. Truck beds shall not contain any water or deleterious material prior to loading.

The Contractor, at no cost to the Owner, shall provide scales for weighing the vehicles used for hauling the bituminous mixture. If of the required accuracy, these scales may be the same as those used to weigh ingredients at the mix plant. The Contractor shall provide such scales at no additional cost to the Owner

02511.3.1.4 PLACEMENT - Except for small areas inaccessible to such equipment, hot bituminous mixtures shall be placed with bituminous pavers. Pavers shall be self-contained, power-propelled units, provided with an adjustable activated-screed or strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths and thickness' as shown on the Drawings. When shown on the Drawings, pavers shall be equipped with a control system capable of automatically maintaining the proper screed elevation.

Placement of the bituminous mixture shall be continuous. The mixture shall be spread and struck off to the grade and elevation established in the Contract Drawings. Unless otherwise shown on the Drawings, mix shall be placed in lifts which, when compacted, will not exceed 4-inches in thickness.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately 6-inches, making sure that the joint in the top layer shall be at the center or dividing line of every two-lanes of traveled roadway. Transverse joints in succeeding layers and in adjacent lanes shall be offset at least 10-feet.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable (along forms, curbs, headers, walls and other places), the mixture shall be placed and finished using hand tools and then thoroughly compacted with hot hand tampers, smoothing irons or mechanical tampers.

Bituminous surface shall not be placed when weather conditions prevent proper handling, hauling and placing of the mixture, when the base course is frozen, when the average temperature of the underlying surface is below 35 degrees F, or when the air temperature reaches 50 degrees F and is falling. Placement on water covered surfaces will not be permitted. Subject to the above restrictions, bituminous mixture placement may begin when the air temperature reaches 45 degrees F and is rising.

02511.3.1.5 COMPACTION - Compaction shall be performed with vibratory or non-vibratory steel-wheel rollers and pneumatic-tire rollers. Initial breakdown rolling shall be accomplished while the mix temperature exceeds 250° F. Rolling shall be completed before the mix temperature drops to 175° F.

Rollers shall begin at the sides and proceed longitudinally parallel to the road centerline, each trip overlapping 6-inches or two times the pavement depth, whichever is greater, gradually progressing to the center. When paving in echelons or abutting a previously placed lane, the longitudinal joint should be rolled first, then followed by the above rolling procedure. On super-elevated curves, the rolling shall begin at the low side and progress to the high side.

Rollers shall not pass over the unprotected end of a freshly laid mixture. Transverse joints shall be formed by cutting back into the previous run to expose the full depth of the course. Heat shall be applied to contact surfaces of transverse joints just before additional mix is placed against them.

02511.3.2 EXCESS BITUMINOUS SURFACE MATERIAL.

Material trimmed from the edges, together with any other discarded bituminous mixture, shall be removed from the roadway and disposed of by the Contractor in an approved area.

02511.3.3 TESTING

02511.3.3.1 CONTRACTOR TESTING - The Contractor shall be responsible for providing the necessary tests for controlling and maintaining the mixture within the limits indicated in the approved job-mix formula. Sampling and testing will be performed on each lot of material as it is placed. Gradation and asphalt content samples will be taken immediately behind the paver at the following rate:

LOT TESTING

Lot Size –Sq.Yds.	Minimum Number of Samples
1500 and greater	4
Less than 1500	3

Density and thickness samples will be taken at a rate of one sample per each lot of up to 1500 square yards. When lot size exceeds 1500 square yards, two samples will be taken.

Checks for smoothness will be made at locations selected by the Engineer for each lot. Smoothness checks will not be required where design transitions will not allow compliance with the criteria.

Acceptance of bituminous material placed shall be made by comparing test results with the job-mix formula and the dimensions provided in these Specifications. Acceptance of each lot will be given when test results are within the following tolerances:

BITUMINOUS TEST

Test	Maximum Deviation
Asphalt Content	Mean of tests on each lot is less than 1%
Gradation	Mean of tests for any sieve size is less than 10%
Density	Any test is 92% or greater
Thickness	Any test is less than 0.5-inches
Smoothness	0.25-inches in 10-feet longitudinally or transversely

Any corrective measures necessary to bring the bituminous surface into compliance must be made while the surface temperature is still greater than 175° F.

See Subsection 02511.5.2 – PRICE ADJUSTMENTS, below.

02511.3.3.2 ENGINEER TESTING – At his own discretion, the Engineer also may spot-check the bituminous mix for acceptability and for determination of compliance with installation requirements. These spot-checks will not be used for acceptance but for guidance. On request, the results will be made available to the Contractor by the Engineer.

02511.4 METHOD OF MEASUREMENT

02511.4.1 NO SEPARATE MEASUREMENT

No separate measurement shall be made for furnishing and installing bituminous surface when it is an integral component of a structure or facility shown as another line item in the Bid Schedule.

02511.4.2 SEPARATE MEASUREMENT

When bituminous surface is shown as a separate pay item in the Bid Schedule, measurement shall be made by counting and adding together each square yard of surface in place and accepted. This measurement shall include furnishing all necessary materials and equipment, labor, weighing, mixing, hauling, placement, compaction, and testing to produce an acceptable bituminous surface.

02511.5 BASIS OF PAYMENT

02511.5.1 ACCEPTED QUANTITIES

The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
(Depth) Hot Plant Mix Bituminous Surfacing	Square Yards

02511.5.2 PRICE ADJUSTMENTS

02511.5.2.1 DEVIATIONS FROM CRITERIA - For deviations from criteria provided by the approved job-mix formula and in these Specifications and Drawings, the unit price shown in the Bid Schedule will be adjusted by application of the pay factor shown in the tables below:

TABLE A - THICKNESS DEFICIENCY

Pay Factor	Average Core Thickness Deficiency (In Inches)
100	0.00 - 0.25
90	0.26 - 0.50
80	0.51 - 0.75
50	0.76 - 1.00
Remove and Replace	More than 1.00

TABLE B - NON-COMPLYING COMPACTION TESTS

Test Method	Pay Factor	Percent Of Bulk Density Target	
		Mean of all Tests	Lowest of all Tests
ASTM D 3203 (Rice Method)	1.00	95 to 100	90 or greater
	0.90	95 to 100	Less than 90
	0.80	92 to 95	90 or greater
	0.50	Less than 92	90 or greater

TABLE C - NON-COMPLYING BITUMEN CONTENT AND AGGREGATE GRADATION

Criteria	Pay Factor	Mean Deviation Of Number Of Tests In Test Lot									
		1 Test		2 Tests		3 Tests		4 Tests		5 or more Tests	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Bitumen Content	1.00	0.0	0.7	0.0	0.54	0.0	0.46	0.0	0.41	0.0	0.38
	0.975	0.0	0.8	0.55	0.61	0.47	0.52	0.42	0.46	0.39	0.43
	0.95	0.0	0.9	0.62	0.68	0.53	0.58	0.47	0.52	0.44	0.47
	0.90	0.0	1.8	0.69	0.75	0.59	0.64	0.52	0.56	0.48	0.52
	0.85	0.0	1.1	0.76	0.82	0.65	0.69	0.57	0.61	0.53	0.56
½" and larger Sieve	1.00	0.0	10.0	0.0	7.3	0.0	6.3	0.0	5.6	0.0	5.2
	0.975	11.0	12.0	7.4	8.3	6.4	7.1	5.7	6.3	5.3	5.8
	0.95	13.0		8.4	9.3	7.2	7.9	6.4	7.0	5.9	6.4
	0.90	14.0		9.4	10.3	8.0	8.7	7.1	7.7	6.5	7.1
	0.85	15.0		10.4	11.3	8.8	9.5	7.8	8.4	7.2	7.7
3/8" Sieve	1.00	0.0	9.0	0.0	6.9	0.0	5.9	0.0	5.3	0.0	4.9
	0.975	10.0		7.0	7.8	6.0	6.6	5.4	5.9	5.0	5.5
	0.95	11.0		7.9	8.7	6.7	7.3	6.0	6.6	5.6	6.1
	0.90	12.0	13.0	8.8	9.6	7.4	8.0	6.7	7.2	6.2	6.6
	0.85	14.0		9.7	10.5	8.1	8.9	7.3	7.9	6.7	7.2
No. 4 Sieve	1.00	0.0	9.0	0.0	6.7	0.0	5.7	0.0	5.2	0.0	4.8
	0.975	10.0		6.8	7.6	5.8	6.3	5.3	5.8	4.9	5.4
	0.95	11.0		7.7	8.5	6.4	6.9	5.9	6.4	5.5	5.9
	0.90	12.0	13.0	8.6	9.4	7.0	7.5	6.5	7.0	6.0	6.5
	0.85	14.0		9.5	10.2	7.6	8.0	7.1	7.6	6.6	7.0
No. 8 Sieve	1.00	0.0	7.0	0.0	5.6	0.0	4.8	0.0	4.3	0.0	4.0
	0.975	8.0		5.7	6.3	4.9	5.4	4.4	4.8	4.1	4.5
	0.95	9.0		6.4	7.0	5.5	6.0	4.9	5.3	4.6	4.9
	0.90	10.0		7.1	7.7	6.1	6.6	5.4	5.8	5.0	5.4

Criteria	Pay Factor	Mean Deviation Of Number Of Tests In Test Lot									
		1 Test		2 Tests		3 Tests		4 Tests		5 or more Tests	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	0.85	11.0	12.0	7.8	8.5	6.7	7.2	5.9	6.4	5.5	5.8
No. 16 Sieve	1.00	0.0	7.0	0.0	5.2	0.0	4.6	0.0	4.2	0.0	3.9
	0.975	8.0		5.3	5.8	4.7	5.1	4.3	4.6	4.0	4.3
	0.95	9.0		5.9	6.4	5.2	5.6	4.7	5.1	4.4	4.7
	0.90	10.0		6.5	7.0	5.7	6.1	5.2	5.5	4.8	5.1
	0.85	11.0	12.0	7.1	7.6	6.2	6.6	5.6	5.9	5.2	5.4
No. 50 Sieve	1.00	0.0	6.0	0.0	4.3	0.0	3.8	0.0	3.4	0.0	3.2
	0.975	7.0		4.4	4.8	3.9	4.1	3.5	3.8	3.3	3.5
	0.95	8.0		4.9	5.3	4.2	4.5	3.9	4.1	3.6	3.8
	0.90	9.0		5.4	5.8	4.6	4.9	4.2	4.4	3.9	4.1
	0.85	10.0		5.9	6.4	5.0	5.5	4.5	4.9	4.2	4.5

02511.5.2.2 REMOVAL OF MIX - The Engineer may order the removal of the mix if the mean result of the lot acceptance tests deviate from the job-mix formula for a particular sieve or sieves, or if the asphalt content is more than the values shown under the 0.85 pay factor in Table C. Where material not meeting this criteria is allowed to remain, a pay factor of 0.50 will be applied.

When the tested density percentage pay factor in Table B is multiplied by the pay factor shown in Table C, and the product is less than 0.80, the Engineer may order removal of the mix. Where material not meeting this criteria is allowed to remain, a pay factor of 0.50 will be applied.

02511.5.2.3 ADDITIONAL MIX - When a lot shows a deficient thickness of more than 0.5-inches, the Engineer may order additional material to be placed and additional payment for the material required will be allowed. When excess thickness is determined, the Engineer may allow it to remain in place; however, only 50 percent of the mix in excess of the 0.5-inch tolerance will be paid for.

02511.5.2.4 OPTIMAL ASPHALT CONTENT PERCENTAGE - Optimal asphalt content percentage will be determined from the job-mix formula provided by the Contractor unless the bituminous mixture is obtained from an established commercial asphalt plant. In such case, the optimum percentage may be determined from previous mixes which meet the criteria provided in these Specifications.

PAVEMENT SAW CUTTING — SECTION 02520

02520.1 DESCRIPTION

This section covers cutting through designated sections of bituminous and/or concrete pavement surface with approved equipment in preparation for pavement removal.

02520.1.1 RELATED WORK

Section 02200 - Trench Excavation and Backfill
Section 02208 - Flowable Backfill (required during winter months)
Section 02500 - Removal and Replacement of Surface Improvements

02520.1.2 SUBMITTALS

Not used.

02520.1.3 DEFINITIONS

Not used.

02520.2 MATERIALS

Not used

02520.3 CONSTRUCTION REQUIREMENTS

02520.3.1 SAW CUTTING

02520.3.1.1 NEATNESS IN CUTTING - Pavement cuts shall be made with a saw to produce straight vertical cuts through the full depth of the surfacing layer. The Contractor is responsible to preserve and maintain a neat clean edge on the cut pavement to facilitate pavement repair or replacement under Section 02500.

02520.3.1.2 CUT MATERIALS TO BE LEFT IN PLACE - Cut pavement materials shall be left in place. Removal of cut pavement will be included as part of other work items in this Contract.

02520.3.1.3 BROKEN PAVEMENT - When pavement has deteriorated or is severely cracked and broken, the Contractor shall discontinue cutting operations and obtain direction from the Engineer as to how cutting should proceed.

If pavement is broken after sawcutting and prior to replacement, the Contractor shall re-cut the pavement. Such re-cutting shall not be measured for payment.

02520.3.2 WHEEL CUTTING

With advanced written approval of the Engineer, wheel cutting may be substituted for saw cutting of bituminous pavement surface. Wheel cutting operations shall be subject to the same requirements as those for saw cutting pavement above.

02520.3.3 ROTOMILLING

Rotomilling of existing pavement is an acceptable alternative to saw cutting, providing that the resulting pavement edges are left clean and neat. Rotomilled material may be suitable for trench backfilling or as a substitute for road base. For such use, rotomilled material must meet the following conditions: that: no chunks or pieces larger than one inch in any dimension are used,

that it is placed in separate lifts from untreated base course, that it is compacted to 95% of its maximum density, and that it is acceptable to the Engineer and to the Owner.

02520.4 METHOD OF MEASUREMENT

Measurement for pavement cutting shall be made using a tape measure or other accurate measuring device to determine the number of lineal feet of pavement cut. This length shall be multiplied by the actual depth of the cut pavement layer, measured in inches, to give the number of inch feet of cut.

An alternative method of measurement is for the Engineer to determine that all pavement cutting shall be paid for by the measured lineal feet without regard to depth.

02520.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
Pavement Sawing	Inch/Foot
Pavement Sawing	Lineal Feet

02810.1 DESCRIPTION

This section covers furnishing and installing chain link fence and gates as indicated on the Drawings

02810.1.1 RELATED WORK

Section 03050 - Portland Cement Concrete

02810.1.2 SUBMITTALS

Not used.

02810.1.3 DEFINITIONS

Not used.

02810.2 MATERIALS

02810.2.1 FENCING FABRIC, SUPPORT, AND CONNECTORS

02810.2.1.1 FABRIC - Fence fabric shall be in accordance with ASTM A-392 and have the following characteristics:

FENCE FABRIC CHARACTERISTICS

Height	6'-0"
Mesh	2 inch, coated
Size Wire	11 gauge
Coating	Zinc (galvanized)

02810.2.1.2 TOP RAIL - Top rail shall be 1 5/8 inch OD, galvanized steel pipe @ 1.82 lbs./ft., or fence tube of equivalent structure, size and strength.

02810.2.1.3 WIRE RING TIES - Use wire ring ties that carry a Class II coating and are 11-gauge wire in accordance with ASTM A-116.

02810.2.1.4 BARBED WIRE - Barbed wire for extension arms shall have the following characteristics:

BARBED WIRE CHARACTERISTICS

Total Number Strands	3 strands barb wire
Wires per Strand	2
Wire Size	12 gauge (minimum)
Barbs	14 gauge, 4 point @ 4" o.c.
Coating	Zinc (galvanized)

02810.2.1.5 TENSION WIRE - Tension wire shall be 7 gauge galvanized coil spring steel wire in accordance with ASTM A-641.

02810.2.1.6 TRUSS RODS - Truss rods shall be 3/8 inch galvanized steel rod.

02810.2.1.7 EXTENSION ARMS - Extension arms for gate and other fence posts shall be fabricated from galvanized steel. They shall be designed and manufactured to carry three separate strands of barbed wire and shall be capable of supporting a 200-pound vertical load at the end of the arm without causing permanent deflection. Gateposts shall be provided with vertical extension arms while all other post shall have 45° angle extension arms. The top rail shall pass through the extension arm fitting.

02810.2.2 POSTS

All pipe posts shall be provided with tops that shed water. All posts, rails, and appurtenances shall be provided in accordance with ASTM A-120, A-121, A-123 or A-153, respectively.

02810.2.2.1 LINE POSTS - Line posts shall be "H" section at 4.10 pounds per lineal foot, or 2-3/8 inch OD galvanized pipe at 3.12 pounds per lineal foot, or fence tube of equivalent size and strength.

02810.2.2.2 END, CORNER, AND PULL POSTS - End, corner and pull posts shall be 2-7/8 inch OD pipe at 4.64 pounds per lineal foot, galvanized pipe or fence tube of equivalent size and strength.

02810.2.2.3 GATEPOSTS - Except where shown otherwise in the Contract Documents, gateposts shall be provided in accordance with the table below. Gateposts shall be Schedule 40 galvanized steel pipe of the diameter and weight shown. Fence tube of equivalent size and strength may be substituted for the galvanized steel pipe specified herein.

GATEPOST SPECIFICATIONS

Leaf Width	**Gate Post OD**	**Lbs per Lineal Ft**	**Concrete Foundation**	
			Diameter	Depth
0’ – 6’	2-7/8”	5.7	12”	3’-0”
Over 6’ to 13’	4”	9.0	18”	4’-0”
Over 13’ to 18’	6-5/8”	18.9	18”	4’-0”
Over 18’	8-5/8”	28.5	18”	4’-6”

02810.2.3 GATES

02810.2.3.1 TYPE AND SIZE - Swing gates of the type and size shown on the Drawings shall be used for all chain link fence gates.

02810.2.3.2 FRAME - Gate frame piping shall be 1 7/8 inch OD galvanized pipe weighing 2.68 pounds per lineal foot. Corner fittings shall be heavy pressed steel or malleable castings.

02810.2.3.3 CATCH AND LOCK - Gates shall be provided with an appropriate steel or malleable iron catch and locking attachment. Double swing gates shall be provided with a center rest and catch mechanism. Stops shall be provided to hold gates open.

02810.2.3.4 FABRIC - Chain link fence fabric used to cover gate frames shall conform to the same standards as the line fence fabric.

02810.2.4 CONCRETE

Concrete for setting posts and other fencing components for chain link fence and gates shall be Class 2000 or higher with 3/4 inch maximum aggregate in accordance with Section 03050 of these Specifications.

02810.3 CONSTRUCTION REQUIREMENTS

02810.3.1 GENERAL

Finished fence shall be plumb, taut, true to line and grade, and complete in all details. Fence shall be installed with a top rail and a bottom tension wire. Top rail shall provide allowance for expansion and contraction due to temperature differential in the coupling devices. The ground shall be graded before fence posts are located to permit the grade of the fence to remain uniform over any local elevations or depressions in the ground line. Any resultant surplus soil or concrete, etc., shall be removed and the line shall be cleaned up prior to completion of the Work.

02810.3.2 POSTS

02810.3.2.1 BRACING - End, corner, pull, slope and gateposts shall be braced to the midpoint of the nearest line post or posts with horizontal braces used as compression members. The bracing material shall be the same as top rail material. The brace posts shall be trussed from the brace back to the bottom of the end, corner, slope or gatepost with steel truss rods with turnbuckles, or other suitable tightening devices used as tension members.

2810.3.2.2 LINE POST PLACEMENT - Line posts shall be placed in accordance with the following spacing requirements:

LINE POST PLACEMENT

Radius of Curve	Maximum Post Spacing
Tangent Section to 500 ft	10 ft.
200 ft. to 499 ft.	8 ft.
100 ft. to 199 ft.	6 ft.
0 ft. to 99 ft	5 ft.

02810.3.2.3 PULL POST PLACEMENT - Pull posts shall be located at 500-foot maximum intervals and/or at all angle points exceeding 20°.

02810.3.3 CONCRETE

02810.3.3.1 DEPTH OF SET - Post sockets in concrete walls shall be set to a minimum depth of 18 inches. Line posts shall be set in concrete to a minimum depth of 18 inches. End, pull, corner and gateposts less than 6 inches in diameter shall be set in concrete to a minimum depth of 24 inches. Gateposts 6 inches diameter and greater shall be set in concrete to a depth of 30 inches

A minimum of 6 inches concrete shall be placed in each posthole below each post depth of set described in the foregoing paragraph.

02810.3.3.2 FINISH - Concrete for fence posts shall be finished with a minimum of 1 inch of concrete left above finish grade and sloped in all directions to allow water to drain away from the post.

02810.3.4 FENCE FABRIC

02810.3.4.1 PLACEMENT - Fence fabric shall be installed on the outward facing side of the posts and parallel to the line of the fabric. It shall be 1 inch above the ground on straight grade with the top edge projecting over the top rail of the fence. Space between the bottom of the fence and the finished ground line shall not exceed 3 inches.

02810.3.4.2 FASTENING - Fence fabric shall be stretched taut and securely fastened to the posts, the top rail and the bottom tension wire. Install the tension wire.

Fabric shall be attached to line posts every 14 inches with 11 gauge hot dip galvanized wire clips or galvanized steel bands. It shall be attached to terminal, corner, and gateposts every 14 inches by using 1/4" x 3/4" tension bars tied to the posts with 1 inch wide, hot-dip galvanized steel bands and 3/8 inch diameter bolts and nuts. Attach to both the top rail and the tension wire with 11 gauge wire ring ties spaced every 24 inches.

02810.3.5 CHAIN LINK GATE

02810.3.5.1 INSTALLATION - Chain link gates of size and type shown on the Drawings shall be installed plumb, level and secure for full opening without interference. The gates shall be installed at the locations shown, unless approved otherwise by the Engineer. Ground items shall be set in concrete for anchorage as recommended by fence manufacturer.

The corners of gate frames shall be fastened together and reinforced with fittings designed for the purpose or by welding. All welds shall be ground smooth.

02810.3.5.2 FABRIC - Chain link fence fabric shall be attached to gate frames with tension bars and tie wire attached to suitable tension connectors spaced at approximately 15 inches at each end, and to the top and bottom rails with tie wires spaced at approximately 24 inches.

02810.4 METHOD OF MEASUREMENT

Measurement for chain link fence shall be made using a tape measure or other accurate measuring device to determine the number of lineal feet of fence installed and accepted. This measurement shall include all work and materials, excavation, concrete and concrete placement, gates and bends, etc., all to be furnished and installed as shown on the Drawings and described herein.

02810.5 BASIS OF PAYMENT

PAY ITEM	UNIT
Chain Link Fence	Lineal Foot

02830.1 DESCRIPTION

This section covers furnishing and installing stock fencing and gates as indicated herein and as shown on the Drawings.

Use stock fence and gates as right-of-way fence and gates.

02830.1.1 RELATED WORK

Section 03300 – Concrete Structures and Slabwork

02830.1.2 SUBMITTALS

Not used.

02830.1.3 DEFINITIONS

Not used.

02830.2 MATERIALS

02830.2.1 FENCE MATERIALS

02830.2.1.1 BARBED WIRE - Barbed wire for fencing shall meet the following standards:

BARBED WIRE REQUIREMENTS

Total Number Strands	As called for on Drawings
Wires per Strand	2
Wire Size	12 gauge (minimum)
Barbs	14 gauge, 4 point @ 4" o.c.
Coating	Zinc (galvanized)

02830.2.1.2 WIRE MESH FABRIC - Wire mesh fabric for fencing shall meet the following standards.

WIRE MESH FABRIC REQUIREMENTS

Wire Grade	Firm
Wire Size	Nominal 0.099
Vertical Spacing	6 inches
Coating	Class 1 Zinc
Fabric Specification	ASTM A-116

02830.2.2 POSTS

02830.2.2.1 STEEL LINE POSTS - Steel line posts shall have either a Y or U cross-section, shall be painted, and shall have been manufactured for use in stock fencing.

02830.2.2.2 WOOD LINE POSTS - All posts must be sound and free of decay, being structurally fit to function properly. Wood line posts shall meet the following requirements:

- Round posts shall have a minimum circumference of 10 inches at the base. All natural-growth round posts shall be free of bark, protruding knots, and any other irregularities.
- Rectangular posts shall have a minimum cross section area of 12 square inches.

- Untreated posts shall be of un-sawn native juniper, or approved equal.

- Treated line posts shall be of Douglas Fir, hemlock or pine. If the treated surface of a post has been disturbed or damaged in handling or installation, the exposed, untreated wood shall receive a minimum of two coats of the same compound with which the post was originally treated.

02830.2.2.3 BRACE, GATE, AND CORNER POSTS – Brace, gate, and corner posts shall conform to ASTM A-702. Steel brace, gate, and corner posts shall have the following characteristics:

02830.2.2.4 GALVANIZED PARTS - Galvanized parts shall be in accordance with ASTM A-123.

02830.2.2.5 ANCHORS - Supply fence stop anchors. Anchor plates on steel posts may be omitted when the post is set in a concrete footing but not otherwise.

02830.2.3 STEEL GATES

02830.2.3.2 FRAME – Frames for driveway and walkway gates shall be of 1-inch diameter pipe as specified in ASTM A-120, Schedule 40. Frames shall have caps or seals to cover the open ends of square corners of gate frames.

02830.2.3.3 WIRE FABRIC – See 02830.2.1.2 above.

02830.2.3.4 BRACING – 10 and 12 foot long gate leafs shall have at least one vertical brace made of the same material as the frame and placed in the center of the leaf. 14 and 14 foot long gate leafs shall have two vertical braces of the same material and spaced evenly in the leaf.

02830.2.3.5 TRUSSING – Gates 10 feet or more in length shall have an adjustable 3/8-inch minimum diameter truss rod installed to prevent sagging of the gate.

02830.2.3.6 FITTINGS - Fittings for gates shall be hot-dipped galvanized steel as specified in accordance with ASTM A-153. Pintles shall be 5/8-inch in diameter or greater for 10-foot and wider gates.

02830.2.3.7 FASTENERS – Fasteners for single gates shall be lengths of galvanized chain a minimum of 18-inches long. One end of the chain shall be secured to the gate while the loose end shall be fitted with a snap fastener appropriate to the size of the chain. For additional security, chain link slot fasteners also may be incorporated into the gate.

Double leaf driveway gates shall have a center latch incorporating a pin or rod which can be dropped from the latch into a socket embedded in concrete in the ground.

02830.2.3.8 STAPLES – Staples shall be 1-1/2-inch minimum length No. 9 wire.

02830.2.3.9 CONCRETE – Concrete shall be Class B (AE) or better.

02830.3 CONSTRUCTION REQUIREMENTS

02830.3.1 GENERAL

Finished fence shall be plumb, taut, securely fastened, true to line and grade, and complete in all details.

02830.3.2 POST INSTALLATION

02830.3.2.1 GATEPOSTS - Except where shown differently on the plans, gatepost installation and concrete foundations for gateposts shall be as determined by the following schedule:

GATEPOST SPECIFICATIONS

Leaf Width	Gate Post OD	Lbs per Ln. Ft.	Concrete Foundation	
			Diameter	Depth
0' – 6'	2-7/8"	5.7	12"	3'-0"
Over 6' to 13'	4"	9.0	18"	4'-0"
Over 13' to 18'	6-5/8"	18.9	18"	4'-0"
Over 18'	8-5/8"	28.5	18"	4'-6"

02830.3.2.2 STEEL LINE POSTS - Construction of 4-strand barbed wire fencing shall require 6-foot posts; 5-strand barbed wire fencing shall use 7-foot posts.

02830.3.2.3 WOOD POSTS - Cut wood posts to the designated height and slant top to an approximate 30^0 angle.

02830.3.2.4 POST BRACING - Install end-braced posts in existing cross fences where they are intersected by the new stock fence. Brace corner posts in two directions. Brace end and gate posts in one direction. Bolt or butt weld metal braces to the metal posts. Tension brace wires until installation is rigid.

02830.3.2.5 TRUSSING - Braced posts shall be trussed back to the bottom of the end, corner, slope or gatepost.

02830.3.2.6 CONCRETE - At sag sections, or at points of vertical alignment change in concrete foundations, set braced posts at least 2-feet 9-inches into the ground for 7-foot, 0-inch posts and at least 2-feet 6-inches into the ground for 6-foot, 0-inch posts. Place a minimum 3-inch concrete base below each brace post. Concrete shall be a minimum 18-inches in diameter. Expose 1-inch on concrete above the finished grade, finish off and slope to drain away from the post. Backfill and compact posts.

Set fence stop anchors in concrete foundations at least 18-inches into the ground. Concrete shall be a minimum of 18-inches in diameter. Finish exposed concrete flush with existing grade.

02830.3.3 FENCE WORK

02830.3.3.1 BARBED WIRE - Barbed wire fencing shall be constructed of either 4-strands or 5-strands of wire as shown on the Drawings and/or described in the Special Provisions attached hereto. See also Sub-Section 02830.3.2.2 – Steel Line Posts, above. Install barbed wire on the inside of the post, away from the traffic.

02830.3.3.2 FABRIC - Wire mesh fabric shall be of the width shown on the Drawings and/or described in the Special Provisions attached hereto. Install fence fabric and barbed wire on the inside of the post, away from the roadway.

Remove all sags from wire mesh fabric without causing tension crimps to fail. Staple top and bottom wires and every alternate lateral wire in the mesh fabric and each strand of barbed wire to the post.

02830.3.4 STEEL GATES

02830.3.4.1 GATES - Supply steel gate frames with wire fabric and appropriate appurtenances for all gates shown on the Drawings.

02830.3.4.2 INSTALLATION - Provide steel gates with fittings to fill all clear openings between gateposts as shown on the Drawings. Install gates to open clearly without interference and to function properly.

02830.4 METHOD OF MEASUREMENT

Measurement for stock fence and gates shall be made using a tape measure or other accurate measuring device to determine the total number of lineal feet of fence installed and accepted. This measurement shall include all material, equipment, labor, excavation and backfill, gates, bends, concrete and concrete placement including gates and bends, all to be furnished and installed as shown on the Drawings and described herein.

02830.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
Stock Fence	Lineal Foot

02900.1 DESCRIPTION

This section covers providing materials, equipment and labor necessary for installing topsoil, turf, trees, shrubs, grasses, forbs, field seeding, re-seeding, fertilizer, mulch, and soil amendments.

02900.1.1 RELATED WORK

Not used.

02900.1.2 SUBMITTALS

The Contractor shall submit for approval product data and seed mixtures in accordance with the requirements of Section 01300.

02900.1.3 DEFINITIONS

Not used.

02900.2 MATERIALS

02900.2.1 TOPSOIL

Topsoil shall be obtained from local sources, and shall have similar soil characteristics to those of the soil at the location where it is to be used. Topsoil shall be obtained from well-drained sites where it occurs to a depth of not less than 4 inches, and it shall not be obtained from bogs or marshes. Topsoil shall be fertile, friable, natural loam, reasonably free of subsoil, clay lumps, brush, weeds, litter, roots, stumps, stones larger than 2 inches in any dimension, or any other material which would inhibit the germination of seeds or the growth of the cover crop.

02900.2.2 TURF SEED

If not otherwise required in the Contract Documents, seed for turf sod shall be composed principally of Kentucky bluegrass (Poa pratensis), testing 99.9% pure live seed (PLS), or as approved. Other acceptable varieties include Merion, Baron, Fylking, Tall Fescue, and Brome.

02900.2.3 TURF SOD

Turf sod shall be vigorous, viable, strongly rooted sod, not dormant or less than 2 years old, free of weeds, undesirable native grasses, insect infestations, and fungus. It shall be machine cut to a pad thickness of 1 inch ($\pm$ 0.33 inch).

02900.2.4 TREES AND SHRUBS

02900.2.4.1 NURSERY GROWN - Trees and shrubs shall be nursery-grown, with botanical and common names of plants true to the approved names given in the latest edition of "Hortus", and shall meet the requirements of the American Standard for Nursery Stock adopted by the American Association of Nurserymen. Plants shall be sound, healthy, vigorous, symmetrically proportioned, well branched, densely foliated when in leaf, free of disease, insect pests, eggs, and larvae and shall have well developed root systems.

02900.2.4.2 ROOT BALLS AND PRUNING - Root balls shall be protected at all times from sun, drying winds and frost. Plants shall not be pruned prior to delivery. If balled and burlapped plants are not installed immediately upon delivery, they shall be set on the ground and protected with moist soil or wet mulch.

02900.2.4.3 WARRANTY - Trees and shrubs shall be warranted for a period of 1 year after Substantial Completion, against death and unsatisfactory growth, except in cases resulting from Owner's neglect, abuse by others or natural phenomena. Unacceptable plant material shall be replaced at end of warranty period. Only one replacement is required.

02900.2.4.4 FIELD SEED MIX

The seed mix listed below is suggested as a standard for field seeding when no other information is available. However, seed mix requirements can vary widely from area to area, and the Contractor shall contact the local office of the Natural Resources Conservation Service (NRCS) to obtain an appropriate seed species mix and application rate for the location in question. The Contractor shall follow the directions of the NRCS, the Engineer, and the property owner in doing field seeding.

SUGGESTED FIELD SEED MIX

Species	**Amount** (%)
Nardan Crested Wheatgrass	30
Russian Wild Rye	20
Y.B. Sweet Clover	15
Slender Wheatgrass	10
Oahe Intermediate Wheatgrass	10
Fairway Crested Wheatgrass	5
Western Wheatgrass	4
Other	6

02900.2.5 RESEEDING AND REVEGETATING

As with the field seed mix, non-field seed mix and/or vegetation requirements are usually area sensitive. Different government agencies, such as the Forest Service or the Bureau of Land Management, may have separate seed mix and vegetation requirements within the same area. The Contractor shall contact the respective property owner at their local office, address, or telephone number to obtain the appropriate reseeding and revegetating requirements and follow the same, in concurrence with the Engineer, in acquiring the appropriate seed and vegetation.

02900.2.6 MULCH

02900.2.6.1 TREE AND SHRUB MULCH - Tree and shrub mulch shall consist of well-aged fibrous or shredded bark, old sawdust, pine needles or leaf mold.

02900.2.6.2 FIELD SEED MULCH - Field seeding mulch shall be certified weed free small grain straw or native hay.

02900.2.6.3 HYDRAULIC MULCH - Hydraulic seeding mulch shall consist of pigments and wood cellulose fiber or paper pulp and shall form a blotter-like ground cover with moisture absorption and percolation properties. It shall have the ability to cover and hold the seed in contact with the topsoil, yet not inhibit the penetration of seedlings through it.

02900.3 CONSTRUCTION REQUIREMENTS

02900.3.1 SCOPE OF REQUIREMENTS

The Contractor shall furnish all equipment, labor, topsoil, seed, seed mixes, turf, shrubs trees or other materials required to landscape, re-seed, or re-vegetate all areas disturbed by the Work, as

required by the Drawings and these Specifications. The disturbed area shall be kept as small as possible.

02900.3.2 EROSION CONTROL

The condition of landscaped, re-seeded and re-vegetated areas shall be checked to determine the effectiveness of erosion control methods and materials. Checks will be made upon project completion, at three months following project completion, and at nine months following project completion. Any modifications or repairs required by the Engineer shall be promptly performed by the Contractor, at no additional cost to the Owner.

02900.3.3 TOPSOIL

02900.3.3.1 REMOVAL OF TOPSOIL - Topsoil to be saved shall be carefully removed to a depth of 24 inches, or to the actual depth of the existing layer, which ever is less, and set aside in a separate location. It shall not be mixed with the remainder of excavated material.

02900.3.3.2 REPLACEMENT OF TOPSOIL - When site work conditions permit, topsoil shall be spread as shown on the Drawings. The minimum depth of topsoil shall be 6 inches over all designated areas. Topsoil shall be fine graded to a firm even surface, matching existing slopes, with no lumps or stones present. The topsoil shall be prepared to a good condition, not muddy or hard, and shall be scarified to a friable condition if it is hard before turf is placed.

02900.3.3.3 PROTECTION AGAINST EROSION - Areas where topsoil has been spread shall be protected against erosion.

02900.3.4 TURF SEED

02900.3.4.1 SEEDBED PREPARATION - Where required, turf seed shall be installed as specified herein. Seedbed preparation shall be accomplished by spreading peat moss or manure uniformly at a rate of 3 cubic yards per 1000 square feet and worked into the soil by light tilling.

02900.3.4.2 APPLICATION - Seed shall be applied at a rate of 2 pounds per 1000 square feet using a drop (band) type spreader unless otherwise approved by the Engineer. The seed shall be divided into two halves and then distributed, half in north/south directions and half in east/west directions. Seed shall be raked into the soil, a layer of mulch shall be applied, and then lightly watered, at least four times daily for two weeks, or until the seed germinates.

02900.3.5 TURF SOD

02900.3.5.1 INSTALLATION - Where required, turf sod shall be laid across slopes such that butt joints alternate. Sod pieces shall be fitted tightly together so no joint is visible and then firmly and evenly hand tamped. The sod shall then be rolled with a 150-pound roller to level and seal all seams.

02900.3.5.2 WATERING - After rolling, sod shall be watered until water soaks into underlying topsoil to a depth of not more than 3 inches. For grades of 50% slope or steeper, the sod shall be secured with wooden pegs driven flush with the soil portion of the sod and 2 feet maximum on center.

02900.3.5.3 MOWING - Prior to Substantial Completion, sod shall be mowed as required to maintain a maximum height of 2 1/2 inches.

02900.3.6 TREES AND SHRUBS

02900.3.6.1 LOCATION - When required trees and shrubs shall be installed, as specified herein, at locations designated on the Drawings. Trees and shrubs to be saved and replanted shall be carefully removed, set aside, protected and preserved until they can be safely replanted.

02900.3.6.2 PREPARATION OF PLANTING PIT - Tree and shrub pits shall be five times the diameter of the root ball. The bed shall be prepared by loosening the soil with a tiller or shovel to a depth of 12 inches. Topsoil and organic matter shall then be added and distributed uniformly within the planting bed as necessary. The Contractor shall not proceed with planting until the pit locations and bedding are approved by the Engineer.

02900.3.6.3 PLANTING - The plant shall be set in the center of a hole of the proper size, plumb and straight. Burlap, ropes and all wire and other materials shall be removed, and then the excavated soil shall be returned to the hole and gently packed around the root ball. The planting shall be flooded with water to promote additional soil consolidation. The Contractor shall give care that, after settling, the top of the root collar shall be even with the adjacent finished grade A 2-inch layer of mulch shall be applied around the base of the tree, to extend 2 feet in radius beyond the root ball.

02900.3.6.4 SUPPORT - Trees shall be guyed with two wires anchored securely to steel posts not less than 5 feet from the trunk, and directly opposite each other. The trees shall be protected from direct contact with the wires.

02900.3.6.5 PRUNING - Each plant shall be pruned with clean, sharp tools, to remove suckers and broken, badly bruised or dead branches. Tree trunks shall be wrapped with Tubex or equivalent translucent material unless directed otherwise by the Engineer.

02900.3.6.6 WATERING - Trees and shrubs shall be watered and maintained until Substantial Completion and defective work shall be corrected as soon as it becomes apparent and as weather and season permit.

02900.3.7 FIELD SEEDING

Field seeding shall be accomplished using one of the following methods.

02900.3.7.1 BROADCAST - Broadcast seeding shall only be applied after October 15 and prior to April 15, unless authorized otherwise and directed in writing by the Engineer. No seed bed preparation will be required for this seeding method.

02900.3.7.2 DRILLING - Drilling shall be set forth in uniform rows with spacing not to exceed 8 inches and the depth set correctly for the type of seed being drilled. The minimum distribution rate shall be 20 pounds per acre, and may be more if so recommended by the local Soil Conservation Service.

02900.3.7.3 HYDRAULIC - For hydraulic seeding the Contractor shall use equipment designed for such work. Seed and water shall be uniformly applied to the areas scheduled to be seeded. Fertilizer, water and approximately 1 ton per acre of hydraulic mulch shall be homogeneously mixed and uniformly applied to seeded areas.

02900.3.8 RESEEDING AND RE-VEGETATING

02900.3.8.1 RE-SEEDING - Reseeding of areas disturbed by the Work shall be accomplished with grasses compatible with the pre-construction vegetation. The Contractor shall consult the local office of the U.S. Forest Service, Bureau or Land Management, Soil Conservation Service, or other applicable affected agency, for appropriate seed species and application rates. Unless otherwise directed by the Engineer or these Specifications, reseeding shall be accomplished by broadcast seeding in accordance with this section.

02900.3.8.2 RE-VEGETATING - Re-vegetation of areas disturbed by the Work shall be accomplished with started trees and shrubs, compatible with the pre-construction vegetation, and is performed in addition to reseeding as discussed in paragraph 02900.3.8.1 above. When re-vegetation is required, the Contractor shall consult the local office of the applicable affected agency, for appropriate species and instructions.

02900.3.9 MULCH

Mulch shall be incorporated as prescribed on the Drawings and in these Specifications. Where the slope exceeds 10%, the Contractor shall use a tie down mulching material.

02900.4 METHOD OF MEASUREMENT

02900.4.1 LUMP SUM - Lump sum measurement for landscaping shall include all grading, soil preparation, planting, furnishing materials and plants in accordance with the Drawings and these Specifications when shown as a single item in the Bid Schedule.

02900.4.2 SEPARATE MEASUREMENT - When and if applicable, separate measurements for topsoil, turf seeding, turf sod laying, reseeding, re-vegetating, mulching and planting of trees and shrubs shall be made in the units shown and as identified in the Bid Schedule.

02900.5 BASIS OF PAYMENT

The accepted quantity(s) shall be paid for at the contract unit price for:

PAY ITEM	UNIT
Landscaping	Lump Sum
Topsoil	Square Yard
Turf, Seed	Square Foot
Turf Sod	Square Foot
Trees & Shrubs	Each
Field Seeding	Acre
Re-seeding	Acre
Mulch	Acre

SPECIAL PROVISION

LANDSCAPING	SECTION SP 02900

Amend the following sections as follows:

02900.4 METHOD OF MEASUREMENT

02900.4.2 FIELD SEED MIX - separate measurement for field seed mix shall be made in the units shown and as identified in the Bid Schedule. Field seed mix will be provided in accordance with section 02900.3 and measured as the quantity of seed provided to the OWNER for the acreage disturbed.

02900.4.3 RE-SEEDING LABOR - separate measurement for reseeding labor shall be made in the units shown and as identified in the Bid Schedule. The measurement for reseeding include the labor and equipment to reseed in accordance with section 02900.3 with the field seed mix measured and paid separately.

02900.4.4 RESTORE LANDSCAPING PARCEL RP03956.01– separate measurement shall be made for the restoration of all landscaping to its pre-disturbed state on parcel RP03956.01 in accordance with landscaping specification 02900. This shall include turf sod and the replacement of any removed trees with minimum 6’ tall, 2” caliper species equivalent as approved by the Engineer.

02900.5 BASIS OF PAYMENT

The accepted quantity(s) shall be paid for at the contract unit price for:

PAY ITEM	UNIT
Field Seed Mix	Acre
Re-Seeding Labor	Acre
Restore Landscaping Parcel RP03956.01	L.S.

DIVISION 3

CONCRETE

SUNRISE
ENGINEERING

03500.1 DESCRIPTION

This is a generic specification covering furnishing and installing of pre-cast concrete units, complete with required accessories as shown on the Drawings and called out in these Specifications.

03500.1.1 RELATED WORK

Section 01300 - Submittals
Section 02224 - Sewer Pipe and Manholes
Section 03050 - Portland Cement Concrete

03500.1.2 SUBMITTALS

03500.1.2.1 SHOP DRAWINGS - Submit shop drawings showing unit design, signed and sealed by a Professional ENGINEER, in accordance with Section 01300. The CONTRACTOR shall not proceed with fabrication until shop drawings have been approved.

03500.1.2.2 UNIT DESIGN – Unit design shall incorporate the following:

- Pre-cast units shall be designed in accordance with ACI 318 and PCA design handbooks under the direction of a Professional ENGINEER experienced in the design of such units.
- Indicate unit locations, unit identification marks, fabrication details, reinforcement, connection details, pertinent dimensions, and erection support points.
- Units shall be designed to support the required shipping and handling loads, and the live, dead and construction loads.
- Component connections shall be designed to provide adjustment to accommodate misalignment of structure during installation.
- The ENGINEER may approve design deviations provided that equivalent units serving the same basic function and intent are furnished at no additional cost to the OWNER. Such deviations shall only be approved upon written request and when accompanied with complete design calculations and drawings.

03500.1.3 DEFINITIONS

Not used.

03500.2 MATERIALS

03500.2.1 ACCESSORIES

Connecting and supporting devices shall be carbon steel in accordance with ASTM A 36. Bolts, nuts and washers shall be carbon steel or stainless steel as required on the Drawings. Grade 60 reinforcement shall be provided for all units.

03500.2.2 IDENTIFICATION MARKS

Unit identification marks shall appear on all manufactured units.

03500.2.3 FINISHES

Shall be in accordance with one of the following paragraphs. If no finish is prescribed on the Drawings, the Standard Finish will be provided.

03500.2.3.1 STANDARD FINISH - Produced in plastic or metal lined forms which impart a smooth finish. Small surface holes, normal form joint marks, minor chips and spalls may be approved. Major or unsightly imperfections, honeycomb or structural defects are not acceptable.

03500.2.3.2 COMMERCIAL FINISH - Produced in plastic or metal lined forms which impart a smooth finish. Remove fins and large projections and fill holes over 1/2 inch with sand-cement paste. Faces shall be true and well defined. Exposed ragged edges shall be corrected by rubbing or grinding.

03500.2.3.3 ARCHITECTURAL GRADE FINISH - Produced in plastic or metal lined forms which impart a smooth finish. Fill holes over 1/4 inch in diameter with sand-cement paste. Grind smooth form offsets or fins over 1/8 inch. Coat with neat cement paste using a float and after paste has dried, rub with burlap to remove loose particles.

03500.2.3.4 SPECIAL FINISHES - Finishes produced by sandblasting, acid washing, or form liners shall be specifically defined on the Drawings or in these Specifications and samples showing texture and color will be required for approval.

03500.2.3.5 PAINTABLE FINISHES - Where unit surfaces will be painted, only form release agents compatible with paints shall be used during fabrication.

03500.3 CONSTRUCTION REQUIREMENTS

03500.3.1 FABRICATION

Fabrication of pre-cast units shall proceed as follows:

03500.3.1.1 RECORDS - Maintain plant records and quality control program during production of structural pre-cast concrete. Make records available to ENGINEER.

03500.3.1.2 MOLDS - Use molds which are rigid and constructed of material that will result in uniform finished products.

03500.3.1.3 PLACEMENT AND VIBRATION - Place and vibrate concrete to ensure: proper consolidation, elimination of cold joints, and minimize entrapped air marks on finished surfaces.

03500.3.1.4 REINFORCEMENT AND FITTINGS - Provide required connecting devices, plates, angles, and connectors to steel framing members, bolts and accessories. Ensure reinforcing steel, anchors, inserts, plates, angles and other cast-in items are sufficiently embedded, anchored and properly located.

03500.3.1.5 LIFTING DEVICES - Embedded lifting or handling devices shall be capable of supporting units in positions anticipated during manufacture, storage, transportation and erection.

03500.3.1.6 FINISHED SURFACE - Ensure finished surfaces of pre-cast structural units are uniform.

03500.3.1.7 CURING - Cure units under identical conditions to develop specified concrete quality and minimize appearance of blemishes such as non-uniformity, staining or surface cracking.

03500.3.2 DELIVERY, STORAGE AND HANDLING

03500.3.2.1 DELIVERY - Unless otherwise approved in writing, do not deliver units to job site until required for installation.

03500.3.2.2 EDGE PROTECTION - Provide edges of units with adequate protection to prevent staining, chipping or spalling of concrete.

03500.3.2.3 HANDLING - Handle pre-cast units in positions consistent with their shape and design. Lift and support only from support points indicated on Shop Drawings.

03500.3.2.4 BLOCKING AND BRACING - Block and laterally brace units while in storage. Provide lateral bracing that is sufficient to prevent bowing and warping. Bracing shall be clean, non-staining and of a type that will not inhibit uniform curing of exposed surfaces.

03500.3.3 INSTALLATION

Do not install pre-cast units until concrete has attained its design compression strength. Install members plumb, level and in alignment. Clean weld marks or other marks, debris or dirt from exposed surfaces of units.

03500.3.4 REPAIR

Repair of damaged units may be acceptable if structural integrity or appearance is not impaired.

03500.4 METHOD OF MEASUREMENT

03500.4.1 NO MEASUREMENT

Separate measurement for pre-cast concrete units will not be made when the unit is a component of a building, assembly or enclosure for which identification is made in the Bid Schedule.

03500.4.2 SEPARATE MEASUREMENT

When pre-cast concrete units appear as a separate item on the Bid Schedule, they will be measured either by counting the number of units installed and accepted or by using a measuring tape or other accurate measuring device to determine the total number of lineal feet of units installed and accepted.

03500.5 BASIS OF PAYMENT

Separate payment for pre-cast concrete units will not be made when they are a component of building, assembly or enclosure identified in the Bid Schedule.
The accepted quantities will be paid for at the contract unit price for:

PAY ITEM	UNIT
Pre-Cast Concrete (*Describe*)	Each
Pre-Cast Concrete (*Describe*)	Lineal Foot

DIVISION 5

METALS

SUNRISE
ENGINEERING

05010.1 GENERAL

This section of the Specifications covers metals and metal work required to furnish, fabricate, and to install the following nonexclusive list of items:

- Aluminum and miscellaneous nonferrous metals
- Anchors and anchor bolts
- Bolts
- Cast-iron frames and covers
- Grating and frames
- Ladders
- Louvers
- Manhole frames and covers
- Metal roof decking
- Miscellaneous metal items shown on the Plans or specified
- Miscellaneous structural steel
- Pipe handrails, pipe sleeves, inserts, and chains
- Platforms
- Sheet metalwork
- Special supports, hangers, and anchors
- Stairs and treads
- Steel lintels
- Supports for mechanical equipment
- Tread plates and frames

05010.1.2 RELATED WORK

Not used.

05010.1.3 SUBMITTALS

Certified copies, in duplicate, of mill tests or reports from a recognized commercial laboratory shall be furnished when requested as to the chemical, tensile, and bending properties of each shipment of structural metal or part thereof having common properties. All tests and analyses shall be made in accordance with the applicable ASTM Specification.

05010.1.4 DEFINITIONS

Not used.

05010.2 MATERIALS

05010.2.1 ALUMINUM

05010.2.1.1 SHEET ALUMINUM - Except as otherwise specified or indicated on the Plans, sheet aluminum shall be alloy 50050H14 conforming to the requirements of ASTM B 209 and shall be not less than 0.025 inch in thickness.

05010.2.1.2 STRUCTURAL ALUMINUM - Structural aluminum shall be 6061-T6, and extruded aluminum shall be 6063-T42.

Aluminum shapes and appurtenant materials shall conform to the requirements of ASTM B 221 and ASTM B 308 and shall be of aluminum alloy known commercially as 6061-T6. Materials not otherwise specified shall conform to the latest applicable Specifications of ASTM.

05010.2.1.3 BOLTS - All bolts for bolting aluminum shall be Type 304 or 316 stainless steel of sizes indicated on the Plans.

05010.2.2 STEEL

05010.2.2.1 SHEET STEEL - Galvanized sheet iron or steel shall conform to ASTM A 525, 1.25-ounce coating; black steel to ASTM A 569.

05010.2.2.2 STRUCTURAL STEEL – Structural steel shall be as follows:

- Unless otherwise specified, structural steel shall conform to ASTM A 36.
- Cast iron shall conform to ASTM A 48, Class 40B.
- Galvanized structural steel or iron shall be "hot dipped" galvanized after fabrication. Electro-galvanizing shall not be used unless specified otherwise.
- All structural steel shall be delivered free from mill scale, rust, or pitting.
- Items not galvanized or protected by a shop coat of paint shall be protected from the weather until erection and painting.

05010.2.2.3 STAINLESS STEEL - Stainless steel, unless specifically specified or indicated on the Plans otherwise, shall be Type 316 or Type 304, nonmagnetic.

05010.2.2.4 STEEL PIPE - Steel pipe shall conform to ANSI B 36.10, Table I.

05010.2.2.5 BOLTS - High tensile bolts shall conform to ASTM A 325.

05010.2.2.6 OTHER ITEMS

Other structural and miscellaneous metal items shall be as indicated on the Plans or as specified elsewhere.

05010.3 CONSTRUCTION (FABRICATION) REQUIREMENTS

05010.3.1 GENERAL

All structural or foundry items shall be carefully fabricated to true dimensions without warp or twist. Welded closures shall be neatly made; and where weld material interferes with fit or is unsightly in appearance, it shall be ground off smooth.

05010.3.1.1 INSTALLATION - Each structural item shall be installed true to level, plumb, alignment, and grade with all parts bearing or fitting the structure or equipment for which it is intended accurately and securely. It shall not be permitted to cock out of alignment, re-drill, reshape, or force to fit any fabricated item. It is the Contractor's responsibility to place anchor bolts or other anchoring devices accurately and to make any surfaces, which bear against structural items smooth and true to level to preclude the necessity of any springing, re-drilling, or reshaping.

05010.3.1.2 SPECIAL ALIGNMENT - Pipe railings, posts, and structural items needing a special alignment to preserve straight, level, even, smooth lines shall be rigidly supported and braced and kept braced until concrete, grout, or dry pack cement mortar has hardened for a period of not less than 48 hours.

05010.3.1.3 FIT - The Contractor shall be responsible for the correct fitting of all metalwork in the field. The Contractor shall take all measurements necessary to properly fit its work in the field, and it shall be governed by and be responsible for these measurements and the proper working out of all details.

05010.3.1.4 WELDING – General welding procedures are as follows (see also Subsections below):

- The Contractor shall notify the Engineer at least 24 hours before starting shop or field welding.
- A welding inspector may check the materials, the equipment, and the qualifications of the welders.
- The inspector may use gamma ray, magnetic particle, dye penetrant, trepanning, or any other aid to visual inspection which it may deem necessary to be assured of the adequacy of the welding.
- The costs of any tests and all re-tests on defective welds shall be borne by the Contractor. Cost in connection with qualifying welders shall also be borne by the Contractor.
- The cost of tests on sound welds will be borne by the Owner.
- Welders doing unsatisfactory work shall be removed or may be required to pass qualification tests again.

05010.3.1.5 MISCELLANEOUS METALWORK - Where anchors, connections, or other details of miscellaneous metalwork are not definitely shown or specified, its material, size, form, attachment, and location shall conform to best practice.

05010.3.1.6 HAZARDOUS PROJECTIONS - Sharp or hazardous projections shall be rounded off and ground smooth.

05010.3.1.7 CHIPS AND DEBRIS - All chips and other debris lodged between contacting surfaces shall be removed before assembly.

05010.3.2 ALUMINUM

05010.3.2.1 STRUCTURAL ALUMINUM

The Contractor shall furnish and install all structural aluminum items in accordance with the Plans and as specified. It shall provide all supplementary parts necessary to complete each item even though such work is not definitely covered by the Plans and Specifications. Its size, form, attachment, and location shall be such as to conform to the best of current practice.

05010.3.2.2 LAYOUT ON ALUMINUM - Hole centers may be center punched and cutoff lines may be punched or scribed. Center punching and scribing shall not be used where such marks would remain visible on the surface of the fabricated material.

When critical dimensions exist, a temperature correction shall be applied in the layout as necessary. The coefficient of expansion shall be taken as 0.000013 per degree F.

05010.3.2.3 CUTTING AND DRILLING ALUMINUM – Aluminum may be cut and drilled as follows:

- Material 1/2 inch thick or less may be sheared, sawed, or cut with a router. Material more than 1/2 inch thick shall be sawed or routed.

- Cut edges shall be true, smooth, and free from excessive burrs or ragged breaks.
- Edges of plates carrying calculated stresses shall be planed to a depth of 1/4 inch. Sawn or routed edges will be acceptable when the finish is of equal quality to a planed edge.
- Re-entrant cuts shall be avoided wherever possible. If used, they shall be filleted by drilling prior to cutting.
- Rivet or bolt holes may be punched or drilled to finished size before assembly.
- The finished diameter of holes for unfinished bolts shall be not more than 1/16 inch larger than the nominal bolt diameter.
- All holes shall be cylindrical and perpendicular to the principal surface. Holes shall not be drifted in such a manner as to distort the metal.
- Flame cutting of aluminum alloys is not permitted.

05010.3.2.4 ALUMINUM FORMING AND ASSEMBLY - Structural aluminum material may not be heated except in forming operations where material may be heated to a temperature not exceeding 400 degrees F for a period not exceeding 30 minutes to facilitate bending. Such heating shall be done only when proper temperature controls and supervision are provided to insure that the limitations on temperature and time are carefully observed.

05010.3.2.5 WELDING ALUMINUM - This Specification shall apply to both field and shop welding operations. The general recommendations and regulations shown in the American Welding Society Specifications D1.1, "Structural Welding Code," apply to 6061-T6 structures. Detail requirements for welding aluminum alloy 6061-T6 are given as follows:

- Filler metal for welding shall be aluminum alloy welding rods conforming to the requirements of AWS A 5.10 and shall be AWS classification ER 4043, ER 5154, ER 5254, ER 5183, ER 5356, or ER 5556.
- The welding process and welding operators shall both meet a qualification tests. The method of qualification shall conform to the method described in the ASME Boiler and Pressure Vessel Code, Section IX, "Welding Qualifications," Part B. Aluminum alloy 6061-T6 shall be used for the qualification test plates. Operators shall be qualified on the basis on bend tests and a fillet weld soundness test.
- Dirt, grease, forming or machining lubricants, or any organic materials shall be removed from the areas to be welded by cleaning with a suitable solvent or by vapor degreasing. Additional operations to remove the oxide coating just prior to welding are required when the inert gas tungsten arc welding method is used. This may be done by etching or by scratch brushing. The oxide coating may not need to be removed if the welding is done with the automatic or semi-automatic inert gas shielded metal arc.
- Suitable edge preparation to assure 100 percent penetration in butt welds shall be used. Oxygen cutting shall not be used. Sawing, chipping, machining or shearing may be used.
- Any welding of aluminum shall be done using a nonconsumable tungsten electrode with filler metal in an inert gas atmosphere (TIG) or using a consumable filler metal electrode in an inert gas atmosphere (MIG). No welding process that requires the use of a welding flux shall be used unless prior approval has been obtained from the Engineer. Preheating for welding is permissible provided the temperature does not exceed 400° F for a total time of 30 minutes.

- Welding of any structure which is to be anodized shall be done using filler alloy rods that will not discolor when anodized. ER 5154, ER 5254, ER 5183, ER 5356, or ER 5556 filler alloy rods shall be used.

05010.3.2.6 PROTECTION OF ALUMINUM SURFACES - Aluminum surfaces to be placed in contact with wood, concrete, masonry, or dissimilar metals other than stainless steel shall be protected as specified in the appropriate sections of Division 9 – Finishes.

05010.3.2.7 BOLTING - Where aluminum comes in contact with steel it shall be bolted with stainless steel bolts and separated or isolated from the steel with neoprene gaskets or washers or as specified in Division 9.

05010.3.3 STEEL

05010.3.3.1 STRUCTURAL STEEL – The following shall apply:

- The Contractor shall furnish and install all structural steel items in accordance with the plans and as specified herein.

- The Contractor also shall provide all supplementary parts necessary to complete each item even though such work may not be specifically covered by the Plans and Specifications.

- Wherever applicable, all fabrication and erection of steel items shall conform to AISC "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings" except as the same may be modified by applicable building codes, the General Conditions, and these Specifications.

05010.3.3.2 WELDING OF STEEL – Both the general recommendations and regulations shown in the American Welding Society Specifications D1.1, "Structural Welding Code," as well as the detail requirements in those specifications apply to welding of steel structures. Welding of steel shall adhere to the following:

- All welding of steel under this section shall be done by welders who have a current AWS certificate for the type of welding to be done by the welder.

- All welding of structural steel type ASTM A 36 shall be done using mild steel covered Arc Welding Electrodes conforming to ASTM A 233, Series E70, or shall be done using Electrodes and Fluxes for Submerged Arc Welding conforming to ASTM A 558, Classification F70-XXXXX, where XXXXX refers to any electrode referred to in ASTM A 558.

- Welding of stainless steels shall be done with electrodes and techniques as recommended in Welded Austenitic Chromium - Nickel Stainless Steels - Techniques and Properties as published by the International Nickel Company, Inc., New York, New York. All welds shall be full penetration welds, unless specified otherwise.

05010.3.3.3 PROTECTION OF STEELWORK - The Contractor shall paint steel and miscellaneous ferrous metal items as specified in the appropriate sections of Division 9-Finishes.

05010.3.4 DUCTWORK

05010.3.4.1 DESIGN AND FABRICATION - Ducts shall be fabricated of aluminum or galvanized steel sheets with gauges of sheet metal, joint types, reinforcing, bracing, supporting, fabricating, installing, and other requirements in accordance with Duct Manual and Sheet Metal Construction

for Ventilating and Air Conditioning Systems of the Sheet Metal and Air Conditioning Contractors National Association, Inc. Ducts shall be designed for the appropriate pressure type as shown in the above mentioned Duct Manual. Details on the Plans in some cases call for sheet metal thicknesses greater than called for in the Duct manual. Sheet metal shall conform to whichever requirement calls for the greater thickness. Aluminum ducting shall be not less than 0.063 inches thick.

05010.3.4.2 HANGERS - Ducts shall be supported on both sides at all changes in direction and at not greater than eight foot intervals by suitable hangers as specified herein or as detailed on the Plans. For galvanized ducting, hangers for ducts 12-inch by 24-inch or smaller shall be galvanized sheet metal straps not lighter than 18-gauge by one inch secured to the structure by one 5/16-inch bolt and to the duct by not less than two No. 10 sheet metal screws or 3/16-inch stove bolts. Hangers for ducts larger than 12-inch by 24-inch shall be galvanized steel straps or rods not less than 0.13 square inches in net cross section, secured to the structure by a Grinnell Figure 152, Size 2, concrete insert, or approved equal, and to a duct pocket or reinforcing angle by two 1/4-inch stove bolts. For aluminum ducting, supports shall be equivalent to supports for galvanized ducting except that all fasteners, fittings, and shafting shall be stainless steel.

05010.3.4.3 FLEXIBLE CONNECTIONS - Where blowers or equipment containing blowers or other machine elements, which may cause vibration, are connected to ducts or housing, such connections shall be by means of flexible connections. These flexible connections shall be airtight at the pressures encountered and be flame proof and water proof. The flexible material shall be equivalent to 14 ounce canvas.

05010.4 METHOD OF MEASUREMENT

Not used.

05010.5 BASIS OF PAYMENT

Not used.

DIVISION 15

MECHANICAL

SUNRISE
ENGINEERING

15110.1 DESCRIPTION

This section is a materials specification and is included for guidance in selecting materials for pipe and related fittings and appurtenances used in the construction of water and sewer systems.

15110.1.1 RELATED WORK

Section 02222 - Waterline Pipe Installation
Section 02224 - Sewer Line Pipe and Manhole Installation
Section 15230 - Waterline Valves and Hydrants
Section 15232 - Water System Control Valves

15110.1.2 SUBMITTALS

The Contractor shall submit for review complete information, showing all pipe, materials, fittings, gaskets, couplings, coatings, linings, supports, mechanical restraints, thrust blocks and configuration prior to the delivery of any components to the project. All information shall be provided in accordance with Section 01300 and written evidence of compliance from the manufacturer shall accompany each delivery of material.

15110.1.3 DEFINITIONS

Not used.

15110.2 MATERIALS

15110.2.1 NSF COMPLIANCE

All pipe and materials furnished and installed for culinary use shall comply with NSF International Standard 61. Also, all plastic pipe must be approved by the NSF for potable water use and shall carry the factory "NSF" stamped label on the pipe indicating such approval.

15110.2.2 POLYVINYL CHLORIDE PIPE (PVC)

15110.2.2.1 PVC PIPE FOR WATER LINE CONSTRUCTION – Shall be as follows:

- For sizes less than 4 inches OD, PVC pipe shall be Schedule Rated pressure pipe meeting the requirements of ASTM D1785 of the schedule and size shown on the Drawings.

- PVC pipe 4 inches and larger, shall be rigid, thermoplastic Class Rated pressure pipe meeting the requirements of ANSI/AWWA Standard C900 or C905 (latest revision). The pressure class or the dimensional ratio and the size shall be as shown on the Drawings.

- While Class Rated and Pressure Rated pipe materials are not interchangeable, when specifically allowed in the Contract Documents, for size 4" and larger, rigid thermoplastic Pressure Rated pressure pipe, meeting the requirements of ASTM D2241, may be furnished and installed. Operating pressure for this pipe shall be as shown on the Drawings.

15110.2.2.2 FITTINGS FOR PVC PIPE – Unless specifically authorized otherwise, fittings for 4 inch and larger size PVC pipe in underground service shall be ductile iron (DI) and shall meet the requirements of NSF 61 and ANSI/AWWA C-153. They shall have a standard coating of cement mortar on the interior surfaces in compliances with AWWA C-104. DI fittings meeting these requirements may be used with smaller PVC piping. PVC fittings meeting the requirements of ANSI/AWWA C-907 may be used with PVC pipe smaller than 4 inches, and, in some instances, where specifically authorized, with PVC pipe sizes 4 inches through 8-inches.

15110.2.3 DUCTILE IRON PIPE

15110.2.3.1 INTERIOR COATING - The interior surface of all DI pipe shall be coated with a standard coating of cement-mortar in accordance with ANSI/AWWA Standard C-104 unless required otherwise in the Contract Documents. Field coating of DI pipe will not be acceptable.

15110.2.3.2 BURIED PIPE – Unless shown otherwise on the Drawings, shall be as follows:

- Buried ductile iron pipe shall be Thickness Class 51.
- Shall meet requirements of ANSI/AWWA C-151.
- Joints shall be bell and spigot or mechanical, which meet the requirements of ANSI/AWWA C-111.

15110.2.3.3 EXPOSED PIPE – Shall meet these requirements, unless shown otherwise on the Drawings:

- Exposed ductile iron pipe shall be Thickness Class 53.
- Pipe shall comply with ANSI/AWWA Standard C-151.
- Pipe joints shall be flanged, meeting the requirements of ANSI/AWWA C-115, or mechanical type couplings (MTC), meeting the requirements of ANSI/AWWA C-606. MTC shall be Victaulic grooved couplings, as manufactured by Victaulic Company of America or approved equal), unless shown otherwise on the drawings.
- 3" to 12" compact flanged fittings shall be ductile iron and shall be produced in accordance with laying lengths specified in ANSI/AWWA C110/A21.10. Flange surface shall be faced and drilled in accordance with ANSI Class 125 B16.1. Nominal body thickness shall be Manufacturer's Standard, but shall not be less than those specified in ANSI/AWWA C153/A21.53 "Standards for Ductile Iron Compact Fittings". Flange thickness shall be in accordance with the Manufacturer's Standards. Working pressure rating shall be 250 psi for water. Fittings shall be made in the United States of America and shall not have been refurbished or reworked by anyone other than the manufacturer. When greater than 250 psi is called for on the Plans, then the Supplier shall furnish higher class rated flanges. Standard Class 125 template for drilling shall be used for all flanges. Drilling templates shall be in multiples of four, so that fittings may be made to face in any quarter. Boltholes shall straddle the centerline and shall be equally spaced. Misalignment of boltholes of two opposing flanges shall not exceed 0.12 inches. Blind flanges 12 inches and over shall be provided with lifting eyes. Insulated flanges shall be provided where required.
- Gaskets shall be full faced, 1/16-inch thick compressed sheets of Aramid fiber base, with nitrile binder and non stick coating, suitable for temperatures to 700°, pressures to 1000 psig and a pH range of 1 to 11. Blind flange gaskets shall cover the entire inside face of the flange and shall be cemented in place. Gaskets shall be as manufactured by John Crane, style 2160; Garlock, style 3000; or approved equal.

15110.2.4 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

15110.2.4.1 PIPE – Shall be as follows:

- PE pipe shall be classified as 445574C, according to ASTM D3350. All PE pipe shall be manufactured according to AWWA C906 and ASTM D3035, F714. For oil and gas piping, PE pipe shall be per API 15LE.

- Pipe shall be made of high density, high molecular weight resin. PE plastic shall have a cell classification of 445574C as defined by ASTM D3350/AWWA C906. It shall be rated as PE4710 according to the requirements of the Plastics Pipe Institute. Internal pressure rating shall be as specified elsewhere in the project documents.

15110.2.4.2 FITTINGS FOR HDPE – Molded fittings shall be made of pre-blended virgin resins in accordance with the materials specifications of ASTM D3350. PE plastic fittings shall have a cell classification of 445574C as defined by ASTM D3350/AWWA C906. Socket fusion fittings shall be manufactured in compliance with ASTM D2683 and butt fusion fittings with ASTM D3261. Measurements of fittings shall be as required by ASTM D2122. All fittings shall be compatible for heat fusion with any pipe manufactured for like or similar resins.

Heat welded Flange Adapter Couplings shall be used for transition to other type piping material. The Contractor shall follow the manufacturer's recommendations, as well as specified procedures herein in fusing fittings to the polyethylene pipe.

15110.2.5 GALVANIZED IRON PIPE AND FITTINGS

Shall be of the schedule rating shown on the Drawings and shall be used only in exposed, non-corrosive atmospheres where piping diameters are less than 4 inches.

15110.2.6 PIPE AND FITTINGS FOR WATER SERVICE LINES

Shall meet the requirements provided in Section 15234 for water service connections.

15110.2.7 PIPE FOR GRAVITY SEWER SYSTEMS

Gravity sewer pipelines may be constructed with PVC or polyethylene (PE) plastic sewer pipe and fittings. Such materials shall be of the type, configuration and size shown on the Drawings and/or on the Bid Schedule.

15110.2.7.1 PVC PIPE - All PVC sewer pipe and fittings shall meet the standards of ASTM D3034 and F679. Such pipe shall be manufactured with a rubber gasketed joining system which meets ASTM D3212 and shall be furnished with a standard dimensional ratio of 35 (SDR 35) for wall thickness, unless shown otherwise on the Drawings.

15110.2.7.2 PE PIPE - All PE sewer pipe shall be smooth, solid wall, high density polyethylene pipe manufactured from PE 4710 material conforming to ASTM D3350 cell classification 445574C rating from the Plastic Pipe Institute. Fittings for this pipe shall be molded from a polyethylene compound equal to or exceeding the properties of the pipe being supplied.

15110.2.8 PIPE FOR PRESSURE SEWER SYSTEMS

Pressure sewer pipelines shall be constructed with DI, PVC, or PE plastic sewer pipe. Fittings and materials shall be of the type, SDR rating, (or pressure class) and size shown on the Drawings and/or on the Bid Schedule.

15110.2.8.1 PVC PIPE - All PVC pipe for pressure sewer lines shall be rigid, pressure rated, thermoplastic pipe which meets the standards of ASTM D2241. Fittings for PVC pipelines shall be Class 50, cement mortar lined, rubber gasketed, DI which meet the requirements of ANSI/AWWA C-153 and C-104.

15110.2.8.2 PE PIPE - PE pipe for pressure sewer lines shall be smooth, solid wall, high density polyethylene pipe manufactured from PE 4710 material conforming to ASTM D3350 cell classification 445574C

rating from the Plastic Pipe Institute. Fittings for this pipe shall be molded from a polyethylene compound equal to or exceeding the properties of the pipe being supplied.

15110.2.9 PIPE AND FITTINGS FOR IRRIGATION SYSTEMS

Pipe and fitting for irrigation systems shall be either DI or Pressure Rated PVC, of the type and class shown on the Drawings, for line diameters 4-inches and greater. Buried lines smaller than 4 inches in diameter shall be Schedule Rated PVC as shown on the Drawings.

15110.2.10 PIPE FOR DRAIN SYSTEMS

Piping for sub-drainage may be constructed with polyvinyl chloride (PVC) or polyethylene (PE) plastic non-pressure drainage or sewer pipe and fittings. Such materials shall be of the type, configuration and size shown on the Drawings and/or on the Bid Schedule.

15110.2.10.1 PVC PIPE - All PVC drainage pipe and fittings shall meet the standards of ASTM F794. Such pipe shall be manufactured with a rubber gasketed joining system which meets ASTM D3212 and may be furnished with ribbed, corrugated or smooth exterior walls with smooth interior wall surfaces, unless shown otherwise on the Drawings. Rubber gasketed joints will not be required for collection pipe applications with perforated or slotted pipe sections.

15110.2.10.2 PE PIPE - All PE drainage pipe shall be solid, corrugated or ribbed wall high-density polyethylene pipe with smooth interior wall surfaces. Material shall be PE 4710 material conforming to ASTM D3350 cell classification 445574C rating from the Plastic Pipe Institute. Fittings for this pipe shall be molded from a polyethylene compound and with equivalent properties and configurations specifically designed to fit the pipe being supplied.

15110.2.11 MISCELLANEOUS FITTINGS AND MATERIALS

15110.2.11.1 PIPE SUPPORTS - Floor mounted pipe supports for suspended, exposed piping systems shall be adjustable stanchion type supports designed to cradle the pipe diameter by 170 degrees. The support shall fit ductile iron or steel diameters snugly, without excessive gaps between the support and the pipe. Support saddle width shall be a minimum of 2 inches wide. The support must offer a minimum of 3 inches of final adjustment, after installation. Supports shall be supplied with independent base and adjustment collar designed to accept standard sized Schedule 40 galvanized steel pipe for coarse adjustment. Supports shall be fabricated from A36 mild steel, and shall have an electro-galvanized finish. Floor mounted pipe supports shall be the Standon Model S92 or C92 as manufactured by Material Resources, Inc., 22700 N. W. Quatama Street, Hillsboro, Oregon 97124, or approved equal. The standard required model shall be the S92. Non standard materials or model numbers shall be as specified on the Drawings.

15110.2.11.2 "Y" STRAINERS - shall be constructed of high-tensile ASTM A126 Class B Cast Iron with blow-off connections and self-aligning cylindrical screens and shall be equal to Watts Regulator Series 77F or better quality.

15110.2.11.3 FASTENERS – Fastener requirements are as follows:

- Unless otherwise required in these Specifications or shown on the Drawings, all bolting hardware for buried pipe, fittings, valves, and components shall be of manufacturer's standard materials.

- Unless otherwise required in these Specifications or shown on the Drawings, all bolting materials for exposed pipe, fittings, valves, and components shall be Type 316 stainless steel. Where space restrictions preclude the use of regular bolts, stainless steel threaded studs may be used on all valve flange connections.

- In all instances where stainless steel threaded fasteners are used, a coating of an approved, permanent anti-seize compound shall be applied to the fastener to prevent galling and to assist in disassembly.

- All bolts and/or studs shall extend through the nuts at least 1/4 inch.

15110.2.11.4 COUPLINGS – Couplings shall meet the following requirements:

- Unless prescribed otherwise on the Drawings or in these Specifications, couplings shall meet the requirements of ANSI/AWWA C-219. All flexible couplings shall meet the minimum requirements of Smith Blair 400 series.

- Sleeves shall have a smooth inside taper and there shall be no surface irregularities on any sealing surface. Gaskets shall be suitable for the project application.

- Flexible couplings for buried DI and PVC pipe sizes 2 through 16 inches in diameter shall be fabricated of steel or ductile iron. For pipe sizes larger than 16 inches, flexible couplings shall be of steel. Coupling components for use in potable water systems shall be factory coated with an FDA approved, bonded epoxy coating, applied to an average 12 mil thickness.

- Flexible couplings for exposed pipe shall be manufactured of steel, unless shown otherwise on the Drawings, or approved by the Engineer. Coupling components for use in potable water systems shall be factory coated with an FDA approved, fusion-bonded epoxy coating, applied to an average 12 mil thickness.

15110.2.11.5 RESTRAINT HARNESS – Where required, restraint harness for bell and spigot pipe joints shall be as manufactured by EBAA Iron Co. or an approved equal. The restraint shall consist of a split bell ring to go behind the bell and a split, serrated ring to grip the pipe on the other side of the joint. The harness shall be held together with clamping bolts and tie bolts. The rings shall be fabricated of 60-42-10 DI conforming to ASTM A-536. Clamping bolts shall be grade 5 zinc coated machine bolts. Tie bolts are of low alloy steel. The harness shall have a minimum working pressure of 150 psi. Harness size shall be as shown in the schedule on the Drawings or as specified in the Special Provisions.

15110.2.11.6 VALVES AND FITTINGS - Shall be as specified in their respective sections in these Specifications.

15110.2.11.7 BOXES AND ENCLOSURES – Shall be of the size, type, and configuration indicated on the Drawings and Contract Documents.

15110.3 CONSTRUCTION REQUIREMENTS

See Sections 02222 and 02224 for construction requirements for applicable piping systems.

15110.4 METHOD OF MEASUREMENT

In general, fittings for pipe and piping systems are, and will be, considered appurtenant to the pipeline being installed unless specifically called out for separate payment on the Bid Schedule.

15110.5 BASIS OF PAYMENT

Not used.

Amend the following sections as follows:

15110.4 METHOD OF MEASUREMENT

In general, fittings for pipe and piping systems are, and will be, considered appurtenant to the pipeline being installed unless specifically called out for separate payment on the Bid Schedule.

15110.4.1 CONNECT 24" PIPE TO 4" PIPE

All fittings, restraints, couplings, tools, additional excavation, and labor necessary to create an acceptable connection from 24" pipe to the 4" pipe as shown in the DRAWINGS will be measured per each connection.

15110.4.2 CONNECT TO EXISTING PIPE

All fittings and labor to connect the new 4" pipe to the existing pipe will be measured per connection and separately from the pipe installation.

15110.4.3 INSTALL NEW SPRING BOX INTAKE PIPE

The intake pipe of the spring box to be replaced will include all equipment, labor, pipe, fittings, and other materials required to install a new pipe penetration, a new collection tee inside the spring box, and burial of the pipe protrusion according to the DRAWINGS. It shall also include connecting to the main line. It shall include capping, sealing, and abandoning the existing intake penetration and removing the existing steel pipe leading to the spring box from the chlorination building.

15110.4.4 INSTSALL MAIN LINE DRAIN PIPE & END PROTECTION

The main line drain and end protection includes all excavation, pipes, fittings, valves, rip rap and labor to install a functional and acceptable drain assembly as shown in the DRAWINGS.

15110.4.5 INSTALL TANK DRAIN PIPE END PROTECTION

The tank drainpipe end protection includes all excavation, connections, fittings, riprap and labor to modify the existing drain to match the DRAWINGS. It does not include replacing the existing drain pipe, a new tank penetration, or appurtenances within the tank.

15110.4.6 INSTALL TANK OVERFLOW AIR GAP ASSEMBLY

Measurement for the tank overflow air gap assembly includes all labor, excavation, pipe, fittings, and precast box with grate to install the assembly as shown in the DRAWINGS.

15110.4.7 INSTALL TANK OVERFLOW AIR GAP ASSEMBLY

Measurement for the tank overflow air gap assembly includes all labor, excavation, pipe, fittings, and precast box with grate to install the assembly as shown in the DRAWINGS.

15110.4.8 INSTALL RIPRAP AT CREEK CROSSINGS

Measurement for the riprap at creek crossings includes all labor, excavation and materials to install the riprap as shown in the DRAWINGS and will be measured per each crossing

15110.5 BASIS OF PAYMENT

The accepted quantity(s) shall be paid for at the contract unit price for:

PAY ITEM	UNIT
Connect 24” Pipe to 4” Pipe	EA
Connect New 4” Pipe to Existing 4” Pipe	EA
Install New Spring Box Intake Pipe	L.S.
Install Main Line Drain Pipe & End Protection	L.S.
Install Tank Drain Pipe End Protection	L.S.
Install tank Overflow Air Gap Assembly	L.S.
Install Riprap at Creek Crossing	EA

15230.1 DESCRIPTION

This section covers furnishing and installing valves and fire hydrants in water transmission and distribution lines, together with fittings, thrust blocking, and boxes and enclosures related to the operating equipment.

15230.1.1 RELATED WORK

Section 02222 - Waterline Pipe Installation
Section 15110 - Pipe and Piping Systems
Section 15232 - Water System Control Valves

15230.1.2 SUBMITTALS

All information shall be provided in accordance with Section 01300. Written evidence of compliance from the manufacturer shall accompany each delivery of material.

15230.1.2.1 VALVES 12 INCHES AND SMALLER, AND HYDRANTS - For valve sizes 12-inches and smaller, and fire hydrants, the Contractor shall furnish the manufacturer's standard data and catalogues for review and approval.

15230.1.2.2 VALVES LARGER THAN 12 INCHES - For all valves sized larger than 12-inches, the Contractor shall furnish shop drawings and technical data prepared by the manufacturer for review and approval.

15230.1.2.3 CONTENT - Submittals shall include complete details, dimensions, weights, diameter of stems, alloy for all valve parts and any information that may be required to assemble, install, operate and maintain the valve.

15230.1.2.4 BUTTERFLY VALVES - Certification of performance together with leakage and hydrostatic tests as described in Section 13 of ASTM/AWWA C-504 shall be furnished to the Engineer upon the Engineer's request.

15230.1.2.5 BALL VALVES - Certification of performance together with leakage and hydrostatic tests as described in Section 5 of ASTM/AWWA C-507, shall be furnished top the Engineer upon the Engineer's request.

15230.1.3 DEFINITIONS

Not used.

15230.2 MATERIALS

15230.2.1 GATE VALVES

15230.2.1.1 COMPLIANCE - All gate valves shall conform to AWWA C-500 or C-509 with the following characteristics:

15230.2.1.2 3-INCH AND SMALLER VALVES - Valves 3-inches and smaller shall be as follows:

- Valves shall be as manufactured by Ford, Hayes, Mueller, Red & White, or an approved equal.
- Valves shall be standard, double-disc, non-rising stem valves with wheel handles.
- Valve bodies shall be all bronze or brass.

- Valves shall be threaded, unless shown otherwise on the Drawings or required in these Specifications.

15230.2.1.3 GATE VALVES 4-INCH THROUGH 14-INCH - Gate valves 4-inches through 14-inches in size shall be as follows:

- Valves shall have a ductile iron body.
- Valves shall have a solid cast iron, rubber coated, wedge gate and a resilient seat.
- Gate shall be designed to work equally well with pressure on either side of it.
- Valves shall be of the non-rising stem type and shall be left hand opening (counter-clockwise) with a 2-inch square operating nut.
- All interior ferrous surfaces exposed to fluid flow shall have an NSF approved, fusion bonded, epoxy coating. Epoxy coatings shall be factory applied by an electrostatic or thermosetting process.

15230.2.1.4 GATE VALVES 16-INCHES AND LARGER - Gate valves 16-inches and larger shall be as follows:

- Valves shall be double-disc gate valves with flanged ends.
- Valves shall be manufactured in accordance with AWWA C-500. Bolts, nuts, studs, etc., used with the gear case also shall conform to the requirements for Bonnet Bolting in AWWA C-500.
- Valves shall have bevel gears and shall be actuated by 2-inch square operating nuts.
- The gears and stuffing box shall be enclosed in a watertight cast or ductile iron case for operation in buried location.
- The case shall be filled with grease at the factory.
- Valves shall be designed to operate in a horizontal orientation.
- Valves shall be equipped with bronze tracks, rollers and scrapers.
- By-pass valves shall be furnished with each valve mounted in position A as indicated in AWWA C-500.

15230.2.1.5 VALVES ON WATER MAINS - Valves on water mains shall have the following features:

- In-line valves shall have push-on or mechanical joints conforming to AWWA C-111.
- Valves attached to side outlets shall be flanged.
- By-pass valves shall be flanged.
- Valves in blow-off lines shall be flanged.
- Valves in fire hydrant lines shall have push-on or mechanical joints.
- Valves in air release and vacuum relief lines shall be flanged or threaded.

- Valves 12-inches and smaller shall be equipped with O-ring packing.

15230.2.2 BUTTERFLY VALVES

15230.2.2.1 MANUFACTURER - Butterfly valves shall be Dresser Industries "450", Allis-Chalmers "Streamseal", Henry Pratt "Groundhog", Mueller Lineseal III, or an approved equal.

15230.2.2.2 COMPLIANCE - Butterfly valves shall conform to AWWA C-504.

15230.2.2.3 CLASS - Valves shall be Class 150 seated, tight closing valves, furnished with mechanical or flanged joints

15230.2.2.4 SEATS - Rubber valve seats shall be replaceable without disassembling the valve and shall not be interrupted by the shafting. Rubber seats may be retained on the disc edge by stainless steel clamping in lieu of bonding to the valve body.

15230.2.2.5 SHAFT PACKING - Shaft packing shall be of the self-adjusting permanent type.

15230.2.2.6 OPERATION - Underground opening and closing shall be accomplished with permanently lubricated screw-type operators, totally enclosed and of watertight construction. Overload protection shall be incorporated into the operator allowing the application of 450 foot-pounds input torque at full-open and full-closed positions without damage to the operator or valve. A 2-inch square wrench nut and valve box shall be provided for operating the valve. Valves shall open counter clockwise unless indicated otherwise in the Special Provisions.

15230.2.3 BALL VALVES

15230.2.3.1 MANUFACTURER - Valves shall be produced by a manufacturer having at least five years experience in the manufacture of water works and valves.

15230.2.3.2 VALVES 4-INCHES AND LARGER - Ball valves, 4-inches and larger, shall be ductile iron or cast-steel body, double seated valves meeting the requirements of ANSI/AWWA C-507.

15230.2.3.3 SMALLER VALVES - Smaller valves shall be stainless steel, bronze, or iron bodied valves of the size, type and class shown on the Drawings.

15230.2.4 CHECK VALVES

15230.2.4.1 COMPLIANCE - Check valves shall be manufactured in accordance with ANSI/AWWA C-508.

15230.2.4.2 DESIGN - Check valves shall be of a clear waterway, swing-check type. They shall be designed to be mounted horizontally. They shall be fitted with flanged ends for easy servicing. They shall have an iron body and be bronze mounted.

15230.2.4.3 SEATING - Valves shall be provided with a metal to resilient material seating.

15230.2.5 HOSE BIBS

Hose bibs shall be 3/4-inch bronze or brass body, Watts Model SC-1, Red & White Model RW 301 or approved equal. All hose bibs shall have a tee handle.

15230.2.6 SAMPLE FAUCET

Sample faucet shall be a ½-inch chromed or brass body hose bib without hose connection threads.

15230.2.7 FIRE HYDRANTS

15230.2.7.1 COMPLIANCE - Fire hydrants shall conform to standard for dry barrel fire hydrants, AWWA C-502 and modifications herein specified.

15230.2.7.2 DESIGN - Hydrants shall be designed as follows:

- Hydrants shall be of the "compression" or "toggle joint" type with safety flange and safety stem coupling above the ground line so that they can be repaired without shutting off the water.
- Hydrants shall be of the dry top design with two or more "O" rings sealing the water from the operating mechanism.
- Hydrants shall be furnished with 5-inch minimum valve openings, one 4 1/2-inch NST pumper connection and two 2 1/2-inch hose connections.
- Hose nozzle threads, pump nozzle threads, operating nut and opening direction shall match existing hydrants in the system.
- Hydrant lengths shall be designed for the cover depth shown on the drawings plus the diameter of the main line pipe.

15230.2.7.3 PAINTING - The portion of the hydrant above the ground line shall be painted in accordance with the Owner's standards.

15230.2.8 OPERATING WRENCHES

Unless notified otherwise by the Engineer, the Contractor shall furnish two, T-handle, operating wrenches for each project incorporating valves with 2-inch, square-head, operating nuts.

15230.2.9 VALVE BOXES

Valve boxes shall be cast iron, two piece, and adjustable valve boxes. Valve boxes shall be of the slip joint type and be of sufficient length for the pipe burial depth required. The cast iron cover of the valve box shall have the word "water" stamped thereon.

15230.2.10 CONCRETE ENCLOSURES

Concrete enclosures for valves shall be precast and of the type, size and configuration shown on the Drawings and shall be fabricated in accordance with the requirements for precast concrete construction provided in Section 03500.

15230.3 CONSTRUCTION REQUIREMENTS

15230.3.1 SETTING VALVES AND VALVE BOXES

All valves shall be set and jointed to the pipe in the manner described for pipe laying and jointing in Section 02222 of these Specifications. Valves shall be oriented with the operating nut vertical. Valve boxes shall be centered and plumb over the operating nut and shall be set so that no shock or stress will be transmitted to the valve. Tops of the valve boxes shall be set flush with the ground surface, concrete collars, or street surfacing, unless otherwise shown on the Drawings.

15230.3.2 VALVE RESTRAINT

Restraint shall be installed on all valves connected with slip-on, gasketed, or O-ring joints (i.e., bell & spigot, mechanical, etc.) in accordance with these Specifications and as shown on the Drawings.

15230.3.3 CONNECTING TO EXISTING MAINS

15230.3.3.1 CONNECTION TO EXISTING WORK - All connections to existing water mains shall be made by the Contractor, unless otherwise provided in these Specifications. The Contractor shall provide labor and materials, including special fittings and restraint devices, required to make the required connections between existing lines and new lines.

15230.3.3.2 INTERRUPTION OF SERVICES - Where the connection of new work to old requires interruption of service, the Owner, Engineer and Contractor shall mutually agree upon a date for such connection which will allow ample time to assemble labor and materials and to notify all customers in accordance with Section 01510.

15230.3.4 FIRE HYDRANT INSTALLATION

15230.3.4.1 SETTING - All hydrants shall stand plumb use hand level with the pumper nozzle facing the street. The hydrant shall be set with the ground line at the location indicated by the hydrant manufacturer.

15230.3.4.2 DRAINAGE - Drainage shall be provided at the base of the hydrant by placing clean gravel under and around the base of the hydrant as shown on the Drawings.

15230.3.4.3 RESTRAINT - All hydrants shall be restrained by setting thrust blocks or mechanical restraint assemblies in accordance with the Drawings.

15230.3.4.4 AUXILIARY GATE VALVES - All fire hydrant assemblies shall include auxiliary gate valves positioned as shown on the Drawings.

15230.3.5 THRUST BLOCKS

Thrust blocks or joint restraints (Mega Lug) shall be formed to prevent coverage of the pipe joints in accordance with the details shown on the Drawings and as described in Section 03100 and 03050. All thrust blocks shall be set against undisturbed earth.

15230.4 METHOD OF MEASUREMENT

15230.4.1 VALVES

Excavation, foundation preparation, restraint devices, valve boxes, backfill, and other miscellaneous devices, materials, or equipment required for installation shall be considered part of and included in the measurement of all valves and valve assemblies.

15230.4.1.1 NUMERICAL COUNT - When valves are installed as separate items or assemblies, the measurement shall be determined by counting the number of each size and type (including any associated valve box and concrete valve box collar) of valve installed and accepted.

15230.4.1.2 LUMP SUM - When valves are located in an enclosure, measurement shall be made as lump sum for the enclosure assembly and shall include the valve, any supplemental valves and fittings in the enclosure, and the enclosure.

15230.4.2 HYDRANTS

Measurement of hydrants shall be made by counting the number of hydrants set and accepted. For each hydrant, this measurement shall include the tee, shut-off gate valve, excavation and backfill, drain gravel, valve box and concrete collar, restraint, hydrant, and 5-feet of pipeline extending from the tee on the main line to the hydrant.

15230.4.3 NO SEPARATE MEASUREMENT

No separate measurement will be made for thrust blocks or other restraint provided with valves and fittings. Neither will separate measurement be approved for sample faucets and hose bibbs. Measurement for these items will be included with the quantity of the assembly whereon they are installed.

15230.5 BASIS OF PAYMENT

The accepted quantities will be paid for at the contract unit price.

PAY ITEM	UNIT
(Size) Gate Valve	Each
(Size) Ball Valve	Each
(Size) Ball Valve	Each
(Size) Butterfly Valve	Each
(Size) Check Valve	Each
Fire Hydrant Assembly	Each

Amend the following sections as follows:

15230.4 METHOD OF MEASUREMENT

15230.4.3 NO SEPARATE MEASUREMENT

No separate measurement will be made for thrust blocks or other restraint provided with valves and fittings. Neither will separate measurement be approved for sample faucets and hose bibbs. Neither will separate measurement be approved for flushing, disinfection, and testing of the tank subsequent to valve replacement. Measurement and payment for these items will be included with the quantity of the assembly whereon they are installed.

15232.1 DESCRIPTION

This section covers furnishing and installing water system control valves, including: pressure release, pressure sustaining, pressure reducing, water level control, air relief, vacuum relief, deep well pump control, back flow prevention and surge control with their enclosures and miscellaneous support equipment.

15232.1.1 RELATED WORK

Section 02222 - Waterline Pipe Installation
Section 03050 - Portland Cement Concrete
Section 03100 - Concrete Forming, Finishing and Curing
Section 03200 - Concrete Reinforcement
Section 15110 - Pipe and Piping Systems
Section 15230 - Waterline Valves and Hydrants

15232.1.2 SUBMITTALS

15232.1.2.1 CERTIFICATION OF COMPLIANCE - Certification of compliance to the standards and Specifications contained herein shall be obtained from the manufacturer and provided by the Contractor at the time of delivery of these materials to the project site.

15232.1.2.2 DESCRIPTIVE LITERATURE - Descriptive literature which identifies the manufacturer, model numbers, materials of which the control valves are fabricated, and their capacities shall be provided by the Contractor in accordance with Section 01300 of these Contract Documents.

15232.1.2.3 OPERATION AND MAINTENANCE INSTRUCTIONS - Manufacturer's installation, operation and maintenance literature for each control valve shall be furnished to the Owner prior to the time of final acceptance for payment.

15232.1.3 DEFINITIONS

Not used.

15232.2 MATERIALS

15232.2.1 GENERAL

All control valves furnished and installed under this contract shall be of the model, size, and type shown on the Drawings or required in these Specifications. They shall have been produced by the same manufacturer and shall be provided by a supplier located in the state in which the installation is to be made. They shall be furnished with a manufacturer applied, NSF approved, fusion bonded, epoxy coating. Seats shall be designed so that they are easily maintained and without edges that induce cutting or wear at low flows. Unless otherwise required to meet specific service conditions, all cast iron or steel valves shall be 150 lb. Class.

15232.2.2 ALTITUDE CONTROL VALVES

Altitude control valves shall be as manufactured by CLA-VAL Company, or approved equal. Valves shall be of ductile iron flanged, spring loaded, 3-way, diaphragm actuated, globe pattern valves. Valve control shall be provided by a pressure difference sensor (and when called for on the Drawings or in these Specifications, fitted with a direct acting solenoid control) with appropriately sized piping and supports. Valves shall have a valve position indicator, cocks to isolate the pilot system and closing speed control. Four-inch and smaller valves shall be fitted with flow clean strainer while larger valves shall be provided with a "Y"-pattern strainer in the pilot control system.

15232.2.3 PRESSURE RELIEF/PRESSURE SUSTAINING VALVES

Shall be ductile iron, modulating, hydraulic operated, pilot controlled, flanged valves with globe pattern. All pressure sustaining valves shall be designed to maintain constant upstream pressure at the set point indicated on the Drawings or in the Special Provisions. Pressure sustaining valves shall be provided with a position indicator operated by a pressure difference sensor and shall have appropriately sized piping and supports. The pilot system shall be capable of being isolated with shut-off cocks, be fitted with a strainer, and shall be able to control closure to prevent surges.

15232.2.4 COMBINATION BACK PRESSURE/SOLENOID SHUTOFF VALVE

Shall be ductile iron, flanged, globe pattern, modulating hydraulic operated, pilot controlled, with solenoid activated shut-off. The valve shall open sufficiently to maintain a pre-set inlet (back) pressure. When the inlet pressure is less than the control setting, the pilot system shall close the valve tight. The pilot system shall be capable of being isolated with shut-off cocks, be fitted with a strainer and shall be able to control closure to prevent surges.

15232.2.5 PRESSURE REDUCING VALVES

Shall be modulating pressure reducing with globe pattern. Valves shall be provided with pilot control which operates such that positive and gradual closure can occur to prevent any surge or line shock. Pressure reducing valves shall be equipped with a valve position indicator, cocks to isolate the pilot system, speed for control of closure and a strainer on the pilot system inlet.

15232.2.6 BACK-FLOW PREVENTION VALVES

Shall be an assembly of double independently acting, spring-loaded toggle lever check valves with two shut-off valves which meet the requirements of ANSI/AWWA C-506. Valve body and cover shall be of bronze. Valves shall be fitted with stainless steel springs and with molded synthetic rubber clapper, poppet and facing rings.

15232.2.7 AIR/VACUUM RELIEF VALVES

Shall be simple lever type, kinetic combination air valves, with cast iron body and stainless steel floats. Vents for air/vacuum relief valves shall be threaded GI pipe and shall be protected with fittings covered with No. 14 stainless steel, bronze or aluminum screen.

15232.2.8 DEEP WELL SOLENOID PUMP CONTROL VALVE

Shall be globe pattern, hydraulically operated diaphragm valve controlled by a solenoid pilot valve. The pilot system shall have separate adjustable flow control valves, a "Y" strainer, and shall be fitted with cocks to enable isolation during servicing. The valve stem shall have a limit switch to serve as an electrical interlock between the valve and pump motor.

15232.2.9 ENCLOSURES

Enclosures for control valves shall be concrete, furnished and installed in accordance with the Drawings and the requirements of Sections 03100, 03200, and 03050 of these Specifications.

15232.2.10 MISCELLANEOUS PIPE, FITTINGS, VALVES AND EQUIPMENT

Miscellaneous pipe, fittings, valves and equipment needed to assemble and support operation of the control valves shall be as shown on the Drawings and in conformance with Sections 02222, 15110, and 15230 of these Specifications.

15232.3 CONSTRUCTION REQUIREMENTS

Prior to installing control valves, the Contractor shall flush, blowout, or otherwise clean all dirt and debris from connecting lines. Control valves shall be installed with appropriate supporting piping and equipment in accordance with manufacturer's recommendations. Control valves shall be fitted with flanged connections or installed in a manner which will allow easy removal in the enclosure or area wherein the valves are installed. As soon as control valves are pressurized (placed in service), the Contractor shall check and adjust, if necessary, all valve assemblies to assure they are adjusted correctly and functioning as designed.

15232.4 METHOD OF MEASUREMENT

15232.4.1 NO MEASUREMENT

Measurement will not be made for control valves that are installed as part of a structure or assembly identified as a separate line item in the Bid Schedule. In such cases, valves and their installation will be included in the lump sum quantity represented for that structure.

15232.4.2 SEPARATE MEASUREMENT

When valves are identified as individual line items on the Bid Schedule, quantities shall be measured by counting the numbers of each type of valve in place and accepted. In such cases, measurement will include all valves, couplings, enclosures, manhole covers, excavating and footings required and other necessary equipment and materials required to complete the assembly as shown on the Drawings.

15232.5 BASIS OF PAYMENT

The accepted quantity will be paid for at the contract unit price:

PAY ITEM	UNIT
Altitude Valve (size, type)	Each
Float Valve (size, type)	Each
Pressure Relief Valve (size, type)	Each
Pressure Sustaining Valve (size, type)	Each
Pressure Reducing Valve (size, type)	Each
Pressure Reducing Valve (size, type)	Each
Back Pressure Valve (size, type)	Each
Backflow Prevention Valve (size, type)	Each
Air Release Valve (size, type)	Each
Vacuum Relief Valve (size, type)	Each
Air/Vacuum Relief Valve (size, type)	Each
Combination Air/Vacuum Valve (size, type)	Each
Sewage Air Relief Valve (size, type)	Each
(Type)Valve Assembly	Each

15234.1 DESCRIPTION

Includes furnishing and installing materials which include excavation, water main tapping, stops, valves, service lines, meters, settings, boxes and other accessories required for installing water services to system users.

15234.1.1 RELATED WORK

Section 02200 - Trench Excavation and Backfill
Section 02222 - Waterline Pipe Installation
Section 15110 - Pipe and Piping Systems

15234.1.2 SUBMITTALS

15234.1.2.1 DESCRIPTIVE LITERATURE - Descriptive literature which identifies the manufacturer, model, size, material and parts lists from which the piping, fittings, valves and meters are manufactured, including installation instructions, shall be provided to the Engineer in accordance with Section 01300.

15234.1.2.2 CERTIFICATION OF COMPLIANCE - Written certification of compliance from the respective manufacturer shall be provided with each delivery of metal fittings, valves and meters.

15234.1.3 DEFINITIONS

Mains - Water distribution pipes, located in streets or rights-of-ways, to which water service connections are made for users of the system.

Tap - The actual connection made to water mains which includes drilling an opening into the main, threading, installing a tapping saddle when appropriate, and inserting (screwing) a valve into the opening.

Saddle - A fitting placed on a pipe to reinforce the pipe wall through which the tapping hole is drilled.

Key - Can mean either: the center piece of a corporation or curb valve which is turned to control flow through the valve; or, the "T-shaped" tool used by operators to reach and turn the key or closing piece of a valve.

Setter (also referred to as "yoke") - Is the prefabricated assembly of pipes and valves installed in a meter box and connected into the service line in which the water meter is mounted (or "set").

15234.2 MATERIALS

15234.2.1 SADDLES

Saddles shall be copper alloy body with copper alloy or stainless steel straps designed and sized specifically for tapping PVC water mains. Threading shall be tapered and the saddle shall conform to ANSI/AWWA C-800. Straps shall provide full support around the circumference of the pipe and have a bearing area of sufficient width along the pipe axis so that the pipe will not be distorted when tightened.

15234.2.2 CORPORATION STOPS

Corporation stops shall be copper alloy body ball-type or balanced pressure, o-ring sealed plug type valves with tapered threads and in conformance with the requirements of ANSI/AWWA C-800.

15234.2.3 CURB VALVES

Curb valves shall be copper alloy body ball-type valves; or balanced pressure, o-ring sealed, plug type valves. Curb valves shall be furnished with cast iron curb boxes and one-piece lids fitted with copper alloy pentagon plug. The curb box shall be sized to properly fit the valve and adjust to the depth to which the valve is set.

15234.2.4 SERVICE LATERAL PIPE

Service lateral pipe shall be as called for on the Drawings and in accordance with the following:

15234.2.4.1 COPPER SERVICE PIPE - Copper service pipe shall be Type K soft, conforming to Federal specification WW-T-799 or ASTM B88-62.

15234.2.4.2 POLYETHYLENE PIPE - Polyethylene service pipe shall conform to the requirements of AWWA C-901, "Polyethylene (PE) Pressure Pipe, Tubing and Fittings, 2-inch through 3-inch for water." PE Pipe shall be pressure tubing conforming to Table 6 of said Specification. Tubing shall be Class 160 with a DR of 9.0 or Class 200 with a DR of 7.3. If not specified, DR 7.3 shall be used.

15234.2.4.3 Ends of polyethylene tubing inserted in compression connections should be fitted with insert reinforcement.

15234.2.5 METER SETTER (YOKE)

Meter setter shall be fit with copper tubing (when required), copper alloy, and copper alloy fittings. Setters shall be furnished with copper alloy body, angle, or straight, ball-type inlet valves with fittings appropriately sized to fit the meter. When required, a cast iron yoke ban shall be furnished to provide the setting.

15234.2.6 CHECK VALVE

Unless indicated otherwise on the Drawings, a check valve shall be provided with each meter setting. Check valves shall be copper alloy bodied, dual valves which meet the requirements of the State and local health authorities and conform to ASTM/AWWA C-510.

15234.2.7 WATER METERS

Water meters shall be cold-water displacement type meters, which complies with ANSI/AWWA C-700. The main case and bottom plate shall be of bronze and the meter shall be sized and equipped as shown on the Drawings. The meters shall be Model SR II by SENSUS Technologies, PMM Multi-Jet Series by Precision Meters, or an approved equal.

15234.2.8 METER BOX

Meter boxes shall be fabricated from rigid PVC or ABS plastic pipe. They shall be white in color. They shall have a minimum diameter of 18-inches, be sized to fit over the meter assembly while allowing reasonable interior access, and shall make an appropriate fit with the meter box ring and cover.

15234.2.9 METER BOX RING AND COVER

The meter box ring and cover shall be cast iron with a minimum diameter of 18-inches but shall be appropriately sized to fit larger meter boxes where required. The words "WATER METER" shall be cast into the cover. The cover shall be a locking type with a pentagonal head, corrosion resistant, screw down, locking device.

15234.2.10 METER BOX DRAINAGE

Meter box drainage shall be provided by placing 3-cubic yards of drain gravel at the base of new meter box drain.

15234.3 CONSTRUCTION REQUIREMENTS

15234.3.1 TRENCHING AND BACKFILL

Trenching and backfill for installation of service connections shall be completed in accordance with Section 02200. Service lines shall have a minimum of 3.5-feet of cover.

15234.3.2 INSTALLATION OF CONNECTIONS

Installation of water service connection components shall be as shown on the Drawings. All connections to PVC pipe shall be made by using a saddle rather than a direct tap. Service lines shall be slightly snaked in the trench near the connection to the water main to allow for some movement to avoid a rigid connection.

15234.3.3 REPLACEMENT OF EXISTING FACILITIES

When replacement of specified components of service connections is required, the Contractor shall: protect existing equipment, provide appropriate connecting fittings to accommodate the new component, use care in removal and salvaging of the existing component, and deliver the existing components to the Owner's maintenance shop or headquarters.

15234.4 METHOD OF MEASUREMENT

15234.4.1 CONNECTIONS

Measurement for service connections shall be made by counting the number of "each" size of connection (consisting of furnishing and installing: (1) service saddle on the water main; (2) drilling and tapping; (3) corporation stop; and (4) the necessary excavation and backfilling) installed and accepted.

15234.4.2 SERVICE LATERALS

Service laterals shall be measured using an accurate measuring device to determine the number of linear feet of each size of service lateral pipe installed between the corporation stop and the meter setter. This measurement shall include furnishing and installing the pipe and appropriate connecting fittings and any necessary trench excavation and backfilling.

15234.4.3 SERVICE METER SETTER ASSEMBLY

Measurement of service meter setter assemblies shall be made by counting the number of each size of assembly furnished, installed, and accepted. This measurement shall include the curb stop meter

setter, connecting fittings, meter box, lid, drain gravel, and the necessary excavation and backfilling.

15234.4.4 WATER METERS

Measurement of water meters shall be made by counting the number of meters of each size furnished, installed, and accepted.

15234.4.5 STOCK WATERING TAPS

Measurement for stock watering taps shall be made by counting the number of each size of connection installed and accepted. This measurement shall include furnishing and installing: (1) service saddle on the water main; (2) drilling and tapping; (3) corporation stop; (4) 20-feet of service lateral; (5) curb stop and box; and (6) the necessary excavation and backfilling required to complete the connection.

15234.4.6 REPLACEMENT OF EXISTING FACILITIES

Where certain components of a total existing water service connection are to be replaced, measurement will be made by counting the number of each size and/or kind of the specifically identified component or components as shown in the Bid Schedule as installed and accepted. Such measurement shall include furnishing and installing the identified component, necessary excavation, and backfill, and salvaging and delivery of any replaced component when designated.

15234.5 BASIS OF PAYMENT

The accepted quantities shall be paid for at the contract unit price for:

PAY ITEM	UNIT
(*Size*) Service Connection	Each
(*Size*) Service Lateral	Linear Foot
(*Size*) Service Meter Assembly	Each
(*Size*) Meter	Each
Replace (*Size*) (*Component Name*)	Each
Install (*Size)(Component Name*)	Each
(*Size*) Stock Watering Tap	Each
(*Size*) Stock Watering Tap	Each

Amend the following sections as follows:

15234.4 METHOD OF MEASUREMENT

15234.4.1 SERVICE CONNECTION

Measurement for service connections shall be made by counting the number of "each" size of connection (consisting of furnishing and installing: (1) service saddle on the water main; (2) drilling and tapping; (3) corporation stop; (4) service lateral to the meter assembly and from the meter assembly to the existing service line; and (5) the necessary excavation and backfilling) installed and accepted. In cases where replacing the service lateral between the main line and meter assembly would require a road crossing the existing service line shall be connected to on either side of the road to form an acceptable connection between the main line and meter assembly.

15234.4.2 SERVICE LATERALS

Wherever service laterals are to be replaced or extended to provide an acceptable service connection from the main line the measurement and payment thereof shall be included in the measurement of service connections and shall not be a separate pay item.

15234.5 BASIS OF PAYMENT

The accepted quantity(s) shall be paid for at the contract unit price for:

PAY ITEM	UNIT
(Size) Service Connection	Each
(Size) Service Meter Assembly	Each
(Size) Meter	Each