	STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES **Division of Facilities Construction and Management**	**DFCM**

STANDARD LOW BID PROJECT – INVITATIONAL
Project Budgets $50,000 - $100,000

January 14, 2010

DEER CREEK STATE PARK, WALLSBURG GROUP USE AREA CULINARY WATER IMPROVEMENTS

DIVISION OF PARKS AND RECREATION
MIDWAY, UTAH

DFCM Project Number 08205510

Horrocks Engineers
728 West 100 South #2
Heber City, Utah 84032

DFCM FORM 1a 070109

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Current copies of the following documents are hereby made part of these contract documents by reference These documents are available on the DFCM web site at http://dfcm.utah.gov/StdDocs/index.html "Standard Documents" – "Reference Documents I" – "Item 6. Supplemental General Conditions" or are available upon request from DFCM:

DFCM Supplemental General Conditions dated July 1, 2009 *
DFCM Supplemental General Conditions dated July 15, 2008
DFCM General Conditions dated May 25, 2005
DFCM Application and Certification for Payment dated May 25, 2005.

*** NOTE: THE NEW SUPPLEMENTAL GENERAL CONDITIONS EFFECTIVE JULY 1, 2009 ADDRESSING HEALTH INSURANCE AND IMMIGRATION ARE REFERENCED AT THE LINK ABOVE.**

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

INVITATION TO BID

Only firms that have been invited to submit bids on this project are allowed to bid on this project.

Sealed bids will be received by the Division of Facilities Construction and Management (DFCM) for:

DEER CREEK STATE PARK, WALLSBURG GROUP USE AREA CULINARY WATER IMPROVEMENTS
DIVISION OF PARKS AND RECREATION – MIDWAY, UTAH
DFCM PROJECT NO: 08205510_

Company	Contact	Fax
Greg Allen Excavating	Greg Allen	435-657-2364
K.W. Robinson Construction	Jared Robinson	435-756-8126
Nolan & Sons Construction	Tony Treasure	801-566-7210

Bids will be in accordance with the Contract Documents that will be available on Thursday, January 14, 2010, and distributed in electronic format only on CDs from DFCM, 4110 State Office Building, Salt Lake City, Utah and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Brent Lloyd, DFCM, at 801-550-5882, No others are to be contacted regarding this bidding process. The construction estimate for this project is $69,330.00.

A **mandatory** pre-bid meeting will be held at Deer Creek State Park, Wallsburg Group Use Area on **Wednesday, January 20, 2010 at 11:00 A.M**. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of **2:30 PM on Tuesday, February 2, 2010** at DFCM, 4ll0 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. NOTE: Bids must be received at 4110 State Office Building by the specified time.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid.

The Division of Facilities Construction and Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of DFCM.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
Joanna Reese, Contract Coordinator
4110 State Office Building, Salt Lake City, Utah 84114

PROJECT DESCRIPTION

This project consists of installation of a 2” Schedule 40 PVC culinary waterline from the existing water well serving the Rainbow Bay Campground to the existing underground tanks serving the Wallsburg Group Use Area at Deer Creek State Park. Included in the project will be modifications to the existing water systems.

The Wallsburg Group Use Area water system is presently being fed by a spring which will be abandoned in such a manor to allow for future irrigation needs. The new piping will make the existing system function from the Rainbow Bay Well.

The Rainbow Bay Well water system is to be upgraded to accommodate the added needs at Wallsburg Group Use; including a new well pump and all associated fittings, valves, electrical & controls.

As an Alternate to the Base Bid for the project, the contractor shall price inspection of the existing Rainbow Bay Well using a video camera and an hourly rate to brush, bail and re-development the well.

Time is of the essence for this project. Both the Rainbow Bay and Wallsburg Group Use Areas must be open and useable to the public in the spring of 2010. Therefore, Substantial Completion of the project will be scheduled for May 1, 2010.

PROJECT SCHEDULE

PROJECT NAME: DEER CREEK STATE PARK, WALLSBURG GROUP USE AREA CULINARY WATER IMPROVEMENTS
DIVISION OF PARKS AND RECREATION – MIDWAY, UTAH
DFCM PROJECT NO. 08205510

Event	Day	Date	Time	Place
Bidding Documents Available	Thursday	January 14, 2010	2:00 PM	DFCM 4110 State Office Bldg SLC, UT and the DFCM web site *
Mandatory Pre-bid Site Meeting	Wednesday	January 20, 2010	11:00 AM	Deer Creek State Park, Rainbow Bay Campground Hwy. 189 Provo Canyon Midway, Utah
Last Day to Submit Questions	Monday	January 25, 2010	10:00 AM	*In Writing to:* Brent Lloyd, Project Manager brentlloyd@utah.gov Fax 801-538-3267
Addendum Deadline (exception for bid delays)	Thursday	January 28, 2010	10:00 AM	DFCM web site *
Prime Contractors Turn In Bid and Bid Bond	Tuesday	February 2, 2010	2:30 PM	DFCM 4110 State Office Bldg SLC, UT
Sub-contractor List Due	Wednesday	February 3, 2010	2:30 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date		May 1, 2010		

***   NOTE: DFCM's web site address is http://dfcm.utah.gov**

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

BID FORM

NAME OF BIDDER ____ DATE _______________

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the Deer Creek State Park, Wallsburg Group Use Area Culinary Water Improvements – Divisionof Parks & Recreation – Midway, Utah – DFCM Project No. 08205510 and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: ____

Wallsburg Group Use Area Culinary Water Improvements
Division of Parks and Recreation
Bid Schedule
DFCM Project No. 08205510

Bid Schedule #1

No.	Item Description	Qty Bid	Unit	Unit Bid Price		Amount	
				Dollars	Cents	Dollars	Cents
1	Mobilization	1	LS				
2	Vertical multi-stage centrifugal pump (0.75 HP) and motor, with ability to pump 6 gpm and raise pressure from 2.5 psi to 40 psi	1	LS				
3	Pump Assembly						
a.	2” non-slam check valve	1	EA				
b.	2” isolation ball valve (before pump and after check valve)	3	EA				
c.	Pressure gauge	2	EA				
d.	2” 90° bend	2	EA				
e.	3”x2” pvc tee on existing 3” line	2	EA				

f.	2” pvc tee	1	EA				
g.	Discharge pipe (3 LF 2” schedule 40 pvc pipe)	1	LS				
h.	Drain pipe (8 LF 2” schedule 40 pvc pipe)	1	LS				
i.	Pipe supports	1	EA				
4	Custom Control Panel						
a.	NEMA 3R enclosure	1	EA				
b.	Thru the door disconnect	1	EA				
c.	Starter and Overload	2	EA				
d.	Alternator	1	EA				
e.	HOA switch	2	EA				
f.	Run Light	2	EA				
g.	Pressure transducer for auto operation	1	EA				
h.	Independent contactor	1	EA				
i.	Control transformer	1	EA				
5	Existing 7’x7’ Vault Improvements						
a.	3” floor drain in center of existing vault with “BASF Water Plug” around penetration void.	1	EA				
b.	Install 3" drain pipe to daylight with screen (1/8" opening size), slope to drain.	1	LS				
c.	4’x4’ outward –opening/locking hatch door replacement (6” min. above ground)	1	LS				
f.	Thrust ring (2-inch) outside of tank (discharge side)	1	EA				
g.	Thrust block outside of tank (discharge side)	1	EA				
h.	Plug void around discharge pipe in existing wall with “BASF Water Plug” or approved equal	1	EA				
6	Multi-stage submersible pump (1 Hp) and motor, with ability to pump 10 gpm and raise pressure from 0 psi to 81 psi	1	LS				
7	Disinfect Well	1	LS				
8	Connect to existing water tank	1	LS				
9	2” gate valve	2	EA				
10	Telemetry						
a.	2600 lineal feet 20 Ga. direct bury 6 pair shielded communication cable	1	LF				
b.	Combine existing SCADA at Wallsburg Group Use Area tank with others.	1	LS				
c.	Install BW liquid level control relay systems	1	LS				

11	2" Schedule 40 PVC PIPE	2760	LF				
12	2" pvc tee	1	EA				
13	2" Altitude Valve	1	EA				
14	Air Release Station	1	EA				
15	Plug and abandon existing 1.5-inch line	1	EA				
16	1/8" opening screen over 1" pipe end	1	EA				
	TOTAL BASE BID						

Additive Alternate #1

No.	Item Description	Qty Bid	Unit	Unit Bid Price		Amount	
				Dollars	Cents	Dollars	Cents
17	Inspect well using downhole video camera	1	LS				
18	Brush, bail and re-develop the well	*	HR				

***** The actual number of hours is unknown at this time; the amount of hours will be as directed by the engineer. The CONTRACTOR will be required to provide a unit bid price.

Base Bid: For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

____ DOLLARS ($________________)
(In case of discrepancy, written amount shall govern)

Additive Alternate #1: For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

____ DOLLARS ($________________)
(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by May 1, 2010, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$250.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of ____

The undersigned Contractor's License Number for Utah is ____________________________.______________

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in the Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract.

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization:

____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

____

Respectfully submitted,

____
Name of Bidder

ADDRESS:

____

____

____
Authorized Signature

INSTRUCTIONS TO BIDDERS

1. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Invitation to Bid.

2. Bids

Before submitting a bid, each contractor shall carefully examine the Contract Documents, shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Invitation to Bid prior to the deadline for submission of bids.

A bid bond properly signed by a qualified surety, as indicated on the DFCM Bid Bond form provided along with this Instruction to Bidders, in the amount of 5% of the bid, shall accompany the bid submission to DFCM. THIS BID BOND MUST BE ON THE DFCM BID BOND FORM PROVIDED WITH THIS INSTRUCTION TO BIDDERS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID unless only one bid is received by DFCM, or the failure to comply with the bid bond requirements is determined by the Director of DFCM to be nonsubstantial based on the following:

(a) the bid bond is submitted on a form other than DFCM's required Bid Bond form and the bid bond meets all other requirements including being issued by a surety firm authorized to do business in the State of Utah and be listed in the U.S. Department of the Treasury Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies for an amount not less than the amount of the bond to be issued. A co-surety may be utilized to satisfy this requirement; and

(b) the contractor provides a bid bond properly signed by a qualified surety and on the required DFCM Bid Bond form by the close of business of the next succeeding business day after the DFCM notifies the bidder of the defective bid bond.

3. Contract and Bond

The Contractor's Agreement will be in the form found in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the contract sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for subcontractors will be specified in the Supplementary General Conditions.

4. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The Subcontractors List shall be delivered to DFCM or faxed to DFCM at 801-538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contracts for a period of up to three years.

5. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Project Manager a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addenda posted on DFCM's web site at http://dfcm.utah.gov. Neither the DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

6. Addenda

Addenda will be posted on DFCM's web site at http://dfcm.utah.gov. Contractors are responsible for obtaining information contained in each addendum from the web site. Addenda issued prior to the submittal deadline shall become part of the bidding process and must be acknowledged on the bid form. Failure to acknowledge addenda may result in disqualification from bidding.

7. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

8. DFCM Contractor Performance Rating

As a contractor completes each DFCM project, DFCM, the architect/engineer and the using agency will evaluate project performance based on the enclosed "DFCM Contractor Performance Rating" form. The ratings issued on this project will not affect this project but may affect the award on future projects.

9. Licensure

The Contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

10. Permits

In concurrence with the requirements for permitting in the General Conditions, it is the responsibility of the Contractor to obtain the fugitive dust plan requirements from the Utah Division of Air Quality and the SWPPP requirements from the Utah Department of Environmental Quality and submit the completed forms and pay any permit fee that may be required for this specific project. Failure to obtain the required permit may result in work stoppage and/or fines from the regulating authority that will be the sole responsibility of the Contractor. Any delay to the project as a result of any such failure to obtain the permit or noncompliance with the permit shall not be eligible for any extension in the Contract Time.

11. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

12. Time is of the Essence

Time is of the essence in regard to all the requirements of the Contract Documents.

13. Withdrawal of Bids

Bids may be withdrawn on written request received from bidder prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

14. Product Approvals

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

15. <u>Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors</u>

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the contractor, subcontractor or sub-subcontractor.

16. <u>Debarment</u>

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by DFCM as part of the requirements for award of the Project.

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That ____ hereinafter referred to as the "Principal," and____, a corporation organized and existing under the laws of the State of ____________________, with its principal office in the City of ______________ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____________________________ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the______________________________________ ____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this __________ day of ________________________, 20_________ .

Principal's name and address (if other than a corporation):

____

____

By:____________________________________

Title: __________________________________

Principal's name and address (if a corporation):

____

____

By:____________________________________

Title: __________________________________

(Affix Corporate Seal)

Surety's name and address:

____

____

By: ___________________________________

Attorney-in-Fact (Affix Corporate Seal)

STATE OF ______________)
) ss.
COUNTY OF ______________)

On this ____ day of ____________, 20____, personally appeared before me ____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _________ day of __________________, 20______.
My Commission Expires: ____________________________
Resides at: ____

____
NOTARY PUBLIC

Agency: ____
Agent: ____
Address: ____
Phone: ____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 070109

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, based on the following:

DOLLAR AMOUNTS FOR LISTING

PROJECTS UNDER $500,000: **ALL FIRST-TIER SUBS $20,000 OR OVER MUST BE LISTED**
PROJECTS $500,000 OR MORE: **ALL FIRST-TIER SUBS $35,000 OR OVER MUST BE LISTED**

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- If there are no subcontractors for the job that are required to be reported by State law (either because there are no subcontractors that will be used on the project or because there are no first-tier subcontractors over the dollar amounts referred to above), then you do not need to submit a sublist. If you do not submit a sublist, it will be deemed to be a representation by you that there are no subcontractors on the job that are required to be reported under State law. At any time, DFCM reserves the right to inquire, for security purposes, as to the identification of the subcontractors at any tier that will be on the worksite.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONTRACTOR LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self" *	$300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	$298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: $350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

* Bidders may list "self", but it is not required.

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

FAX TO 801-538-3677

PROJECT TITLE: ____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: ____

DATE: ______________________ SIGNED BY: ____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR OWNER'S REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY OWNER. ATTACH A SECOND PAGE IF NECESSARY.

CONTRACTOR'S AGREEMENT

FOR:

____
____
____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _________, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _______________________________, incorporated in the State of ___________ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _________________________________.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at ________________________ ____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by ____ and entitled "____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 and Supplemental General Conditions dated July 15, 2008 and July 1, 2009 ("also referred to as General Conditions") on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _________________________________ ____ DOLLARS AND NO CENTS ($________.00), which is the base bid, and which sum also includes the cost of a 100% Performance Bond and a 100%

Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete by ___________. Contractor agrees to pay liquidated damages in the amount of $______ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Invitation to Bid, Instructions to Bidders/ Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the Contractor requests payment and agrees to safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor’s Agreement. The Contractor shall not assign this Contractor’s Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor’s Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: ____________________

____
Signature Date

Title: ________________________________

State of ______________)
)
County of ______________)

____
Please type/print name clearly

On this ____ day of __________, 20____, personally appeared before me, ___________________, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _________________ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

____
Notary Public

(SEAL)

My Commission Expires _________

APPROVED AS TO AVAILABILITY OF FUNDS:

____
David D. Williams, Jr. Date
DFCM Administrative Services Director

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

____
Lynn A. Hinrichs Date
Assistant Director Construction Management

APPROVED AS TO FORM:
ATTORNEY GENERAL
July 1, 2009
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That ____ hereinafter referred to as the "Principal" and ____, a corporation organized and existing under the laws of the State of _________, with its principal office in the City of ________________ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of ____ DOLLARS ($_________________) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _______ day of _______________, 20____, to construct ____ in the County of ________________, State of Utah, Project No. ________________, for the approximate sum of ____ Dollars ($__________________), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _______________, 20_____.

WITNESS OR ATTESTATION:

____

PRINCIPAL:

____

By: ____ (Seal)

Title: ____

WITNESS OR ATTESTATION:

____

SURETY:

____

By: ____

Attorney-in-Fact (Seal)

STATE OF _________________)
) ss.
COUNTY OF _________________)

On this ______ day of __________________, 20___, personally appeared before me ____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this ________ day of _______________________, 20______.

My commission expires: _________________________
Resides at: ____________________________________

____
NOTARY PUBLIC

Agency: ____
Agent: ____
Address: ____
Phone: ____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That ____ hereinafter referred to as the "Principal," and __________________ ________________________, a corporation organized and existing under the laws of the State of ____________________authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____________, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of ____ Dollars ($__________________) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _______ day of __________________, 20____, to construct ____ in the County of _________________, State of Utah, Project No. _________________ for the approximate sum of __________________________________ ____ Dollars ($__________________), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this ______ day of ______________, 20____.

WITNESS OR ATTESTATION:

____

PRINCIPAL:

____

By: ____ (Seal)

Title: ____

WITNESS OR ATTESTATION:

____

SURETY:

____

By: ____

Attorney-in-Fact (Seal)

STATE OF _________________)

) ss.

COUNTY OF ________________)

On this _______ day of _______________________, 20_____, personally appeared before me ______________________________________ ____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this ______ day of _____________________________, 20______.

My commission expires: _________________________________

Resides at: ____

____

NOTARY PUBLIC

Agency: ____

Agent: ____

Address: ____

Phone: ____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT ____ PROJECT NO: __________________________

AGENCY/INSTITUTION ____

AREA ACCEPTED ____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _________ (time) on ___________________ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

____

____

The Owner acknowledges receipt of the following closeout and transition materials:

As-built Drawings	O & M Manuals	Warranty Documents	Completion of Training Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of _____________(Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within ______________ ____calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: $________________. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

___________________________ by: ____

CONTRACTOR (include name of firm) (Signature) DATE

___________________________ by: ____

A/E (include name of firm) (Signature) DATE

___________________________ by: ____

USING INSTITUTION OR AGENCY (Signature) DATE

___________________________ by: ____

DFCM (Owner) (Signature) DATE

4110 State Office Building, Salt Lake City, Utah 84114
telephone 801-538-3018 • facsimile 801-538-3267 • http://dfcm.utah.gov

cc: Parties Noted
DFCM, Director

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

General Contractor Performance Rating Form

Project Name:		DFCM Project#	
Contractor: (ABC Construction, John Doe, 111-111-1111)	A/E: (ABC Architects, Jane Doe, 222-222-2222)	Original Contract Amount:	Final Contract Amount:
DFCM Project Manager:		Contract Date:	
Completion Date:		Date of Rating:	

Rating Guideline	QUALITY OF PRODUCT OR SERVICES	COST CONTROL	TIMELINESS OF PERFORMANCE	BUSINESS RELATIONS
5-Exceptional	Contractor has demonstrated an exceptional performance level in any of the above four categories that justifies adding a point to the score. Contractor performance clearly exceeds the performance levels described as "Very Good"			
4-Very Good	Contractor is in compliance with contract requirements and/or delivers quality product/service.	Contractor is effective in managing costs and submits current, accurate, and complete billings	Contractor is effective in meeting milestones and delivery schedule	Response to inquiries, technical/service/ administrative issues is effective
3-Satisfactory	Minor inefficiencies/errors have been identified	Contractor is usually effective in managing cost	Contractor is usually effective in meeting milestones and delivery schedules	Response to inquires technical/ service/administrative issues is somewhat effective
2-Marginal	Major problems have been encountered	Contractor is having major difficulty managing cost effectively	Contractor is having major difficulty meeting milestones and delivery schedule	Response to inquiries, technical/service/administrative issues is marginally effective
1-Unsatisfactory	Contractor is not in compliance and is jeopardizing achievement of contract objectives	Contractor is unable to manage costs effectively	Contractor delays are jeopardizing performance of contract objectives	Response to inquiries, technical/service/administrative issues is not effective

1. Rate Contractors quality of workmanship, management of sub contractor performance, project cleanliness, organization and safety requirement.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

2. Rate Contractor administration of project costs, change orders and financial management of the project budget.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

3. Rate Contractor's performance and adherence to Project Schedule, delay procedures and requirements of substantial completion, inspection and punch-list performance.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

4. Evaluate performance of contractor management team including project manager, engineer and superintendent also include in the rating team's ability to work well with owner, user agency and consultants.	**Score**
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

5. **Rate success of Contractor's management plan, completion of the plans mitigation of project risks and performance of value engineering concepts.**	Score
Agency Comments:	
A & E Comments:	
DFCM Project Manager Comments:	

Signed by:	**Date:**	**Mean Score**

Additional Comments:

CONTRACT DOCUMENTS, SPECIFICATIONS, & PLANS

FOR

STATE OF UTAH-DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

DFCM PROJECT #08205510

RAINBOW BAY WATERLINE AND BOOSTER PUMP

December 2009

Project Engineer

Chuck Richins
Utah P.E. No. 354123

LICENSED PROFESSIONAL ENGINEER
No. 354123
CHUCK A.
RICHINS
12-22-09
LICENSED
STATE OF UTAH

Prepared by:

HORROCKS
ENGINEERS

728 West 100 South, #2
Heber City, Utah 84032

TABLE OF CONTENTS

Contract Documents

SECTION 00320

MEASUREMENTS AND PAYMENTS

PART 1 GENERAL

1.1 The method of measurement and payment for the various items comprising the completed work follows: Payment for the items shall be compensation in full for the furnishing of all overhead, labor, material, tools, equipment, and appurtenances necessary to complete the work in a good, neat, and satisfactory manner as indicated on the Plans or as specified, with all connections, testing, disinfecting, painting, cleanup, and related work completed. Each item, fixture, piece of equipment, etc., shall be complete with all necessary connections and appurtenances for the satisfactory use and/or operation of said item. No additional payment will be made for work related to each item unless specifically noted or specified. Measurement will be in place in the completed work with no allowance for waste.

PART 2 COMPENSATION FOR ALTERED QUANTITIES

2.1 When the accepted quantities of work vary from the quantities in the bid schedule, the Contractor shall accept as payment in full, so far as contract items are concerned, payment at the original contract unit prices for the accepted quantities of work done. No allowance will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly from such alterations or indirectly from unbalanced allocation among the contract items of overhead expense on the part of the Contractor and subsequent loss of expected reimbursement therefore, or from any other cause.

2.2 The Engineer reserves the right to make at any time during the progress of the work, such increases or decreases in quantities and such alterations in the details of construction, and the elimination of one or more items as may be found necessary or desirable. Such alterations shall not be considered as a waiver of any conditions of the contract nor invalidate any of the provisions thereof nor release the surety. The Contractor agrees to accept the work as altered the same as if it had been a part of the original contract.

PART 3 MEASUREMENTS AND PAYMENT

<u>ITEM 1: MOBILIZATION</u>

Measurement and payment for mobilization will be paid as a lump sum payment based on the percentage of the job that is complete. The bid amount shall not exceed ten (10) percent of the contract amount. Furnish data and documentation to substantiate the amounts claimed under mobilization. Limit amounts included under mobilizations to the following items:

1. Moving on the site any equipment required for operations.
2. Developing construction water supply.
3. Providing on-site sanitary facilities and potable water facilities as specified.
4. Arranging for and erection of Contractor's work and storage yard.
5. Contractor and Subcontractor insurance and bonds.
6. Obtaining all required permits, licenses, and fees.
7. Developing construction schedule.
8. Traffic Control

<u>ITEM 2: MULTI-STAGE CENTRIFUGAL PUMP WITH 0.75 HP</u>

Measurement and payment for the Multi-Stage Centrifugal Pump with 0.75 Hp, and components will be paid as a one time lump sum payment. Such payment will be compensation in full for designing, furnishing, and delivering the pump system and related equipment to the project site. All internal electrical work required shall also be included.

ITEMS 3: BID SCHEDULE ITEMS A THRU I: PUMP ASSEMBLY

Measurement and payment for the Pump Assembly will be paid as a Unit Price payment for each item listed a thru i. Such payment will be compensation in full for designing, furnishing, modifying, and installing new equipment required for the Pump Assembly. All necessary equipment shall be included, in addition to all electrical, electrical access, and mechanical work required. All work and materials required for the system to function as specified shall be included.

ITEMS 4: BID SCHEDULE ITEMS A THRU I: CUSTOM CONTROL PANEL

Measurement and payment for the Custom Control Panel will be paid as a Unit Price payment for each item listed a thru i. Such payment will be compensation in full for designing, furnishing, modifying, and installing new equipment required for the Custom Control Panel. All necessary equipment shall be included, in addition to all electrical, electrical access, and mechanical work required. All work and materials required for the system to function as specified shall be included.

PROCESS DESCRIPTION:

Inlet Pressure	2.5 psi
Outlet Pressure	40 psi
Pressure Head Increase From Pump	85 feet
Flow From Pump	6 gpm
Pressure Transducer Function:	
Pressure to be modified in the field.	

ITEM 5: BID SCHEDULE ITEMS A THRU H: EXISTING 7'X7' VAULT IMPROVEMENTS

Measurement and payment for the Existing 7'x7' vault improvements will be paid as a Unit Price payment for each item listed a thru h. Such payment will be compensation in full for designing, furnishing, modifying, and installing new equipment required for the existing vault. All necessary equipment shall be included, in addition to all mechanical work required, clearing, grubbing, stripping, excavation, removal of obstructions, shoring and bracing, bedding, compaction, surface restoration, landscape restoration to its original condition, concrete saw-cutting, concrete work, delivery of existing access hatch to owner, and all appurtenances as specified on the plans and in the specifications shall be included.

ITEM 6: MULTI-STAGE SUBMERSIBLE PUMP WITH 1 HP

Measurement and payment for the Multi-stage Submersible Pump with 1 Hp, and components will be paid as a one time lump sum payment. Such payment will be compensation in full for designing, furnishing, delivering the pump system and related equipment to the project site, installation, and removal and delivery of the existing pump to the owner. All internal electrical work required shall also be included.

PROCESS DESCRIPTION:

Inlet Pressure	0 psi
Outlet Pressure	81 psi
Pressure Head Increase From Pump	185 feet
Flow From Pump	9 gpm

ITEM 7: DISINFECT WELL

Measurement and payment for disinfecting the well will be based on completion of the entire WORK as a lump sum unit, all in accordance with the requirements of these Contract Documents. Payment for furnishing, operating, and removing disinfect equipment and supplies will be made at the lump sum price listed on the Bid Schedule form, which price shall constitute full compensation for all work. Well disinfection shall be done in accordance with DDW [R309-515-6-(11)].

ITEM 8: CONNECT TO EXISTING WATER TANK

Measurement and payment for this item will be each. Payment will be made at the unit price bid for the connection made at the existing Wallsburg Bay Tank. Such payment will be compensation in full for completely making the tank connection complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, dewatering, shoring and bracing, compaction, bedding, surface restoration, landscape restoration to its original condition, flushing, disinfecting, testing, fittings, wall penetration repair mortar, and all appurtenances as specified or indicated on the Plans and Specifications.

ITEM 9: 2-INCH GATE VALVE

Measurement and payment for this item will be each. Payment will be made at the unit price bid per gate valve. Such payment will be compensation in full for furnishing and completely installing each gate valve complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, dewatering, shoring and bracing, bedding, compaction, surface restoration, landscape restoration to its original condition, flushing, disinfecting, testing, thrust blocks, tracer wire, adjusting to grade with collar, fittings and all appurtenances as specified or indicated on the Plans and Specifications.

ITEM 10: BID SCHEDULE ITEMS A THRU C: TELEMETRY

Measurement and payment for the Telemetry will be paid as a Unit Price payment for each item listed a thru c. Such payment will be compensation in full for designing, furnishing, modifying, and installing new equipment required for the Telemetry complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, bedding, compaction, surface restoration, level grading of disturbed areas and planting of native grass seed, and all appurtenances as specified or indicated on the Plans and Specifications. All necessary equipment shall be included, in addition to all electrical, electrical access, and mechanical work required. All work and materials required for the system to function as specified shall be included.

PROCESS DESCRIPTION:

1. The Rainbow Bay tank will need to turn the well/submerssible pump on.
2. The Wallsburg Bay tank will need to turn the booster pump on.
3. When the booster pump is on, the well/submerssible pump will need to turn on so the booster pump will not drain the Rainbow Bay tank.
4. Install 20 gauge direct bury 6 pair shielded communication cable from booster pump to Wallsburg Bay tank in same trench as proposed water line.

ITEM 11: 2-INCH SCHEDULE 40 PVC PIPE

Measurement and payment for this item will be for the linear feet of pipe installed, measured along the center line of the pipe. Payment will be made at the unit price bid per linear foot. Such payment will be compensation in full for furnishing and installing pipe ,with 5 ft min. cover, complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, dewatering, shoring and bracing, bedding, compaction, tracer wire, access road restoration, surface restoration, level grading of disturbed areas and planting of native grass seed, flushing, disinfecting, testing, fittings, and all appurtenances as specified or indicated on the Plans and Specifications.

ITEM 12: 2-INCH PVC TEE

Measurement and payment for this item will be each. Payment will be made at the unit price bid per tee. Such payment will be compensation in full for furnishing and completely installing each tee complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, dewatering, shoring and bracing, bedding, compaction, surface restoration, landscape restoration to its original condition, flushing, disinfecting, testing, thrust blocks, tracer wire, fittings and all appurtenances as specified or indicated on the Plans and Specifications.

ITEM 13: 2-INCH ALTITUDE VALVE

Measurement and payment for this item will be each. Payment will be made at the unit price bid per altitude valve. Such payment will be compensation in full for furnishing and completely installing the altitude valve complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, dewatering, shoring and bracing, bedding, compaction, surface restoration, landscape restoration to its original condition, flushing, disinfecting, testing, thrust blocks, tracer wire, adjusting to grade with collar, fittings and all appurtenances as specified or indicated on the Plans and Specifications.

PROCESS DESCRIPTION:

1. Tank elev=low; booster pump=on; altitude valve=open.
2. Tank elev=full; booster pump=off; altitude valve=closed

ITEM 14: AIR RELEASE STATION

Measurement and payment for this item will be each. Payment will be made at the unit price bid for the air release station. Such payment will be compensation in full for furnishing and completely installing the air release station complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, dewatering, shoring and bracing, bedding, compaction, surface restoration, landscape restoration to its original condition, flushing, disinfecting, testing, thrust blocks, tracer wire, adjusting to grade, fittings and all appurtenances as specified or indicated on the Plans and Specifications.

ITEM 15: PLUG AND ABANDON EXISTING 1.5-INCH LINE

Measurement and payment for this item will be each. Payment will be made at the unit price bid per each line that is plugged. Such payment will be compensation in full for furnishing and completely installing each plug and 4'x4' marking post complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, surface restoration, landscape restoration to its original condition, fittings and all appurtenances as specified or indicated on the Plans and Specifications.

ITEM 16: 1/8-INCH OPENING SCREEN OVER 1-ENCH PIPE END

Measurement and payment for this item will be each. Payment will be made at the unit price bid per screen. Such payment will be compensation in full for furnishing and completely installing each screen complete in place including all cost of clearing, grubbing, stripping, excavation, removal of obstructions, surface restoration, landscape restoration to its original condition, fittings and all appurtenances as specified or indicated on the Plans and Specifications.

ADDITIVE ALTERNATE #1

ITEM 17: INSPECT WELL USING DOWNHOLE VIDEO CAMERA

Measurement for payment for inspecting the well with a downhole video camera shall be based on completion of the Work as a Lump Sum unit. The lump sum price listed on the Bid Schedule form shall be full compensation for moving in and moving out the video logging equipment, set-up, providing copies of the video logs, subsistence and incidentals, rig-time, standby time, and all costs for the CONTRACTOR to provide the video logs.

ITEM 18: BRUSH, BAIL AND RE-DEVELOP THE WELL

Measurement for payment for brushing, bailing and re-developing the well will be based on the actual number of hours of downhole brushing, bailing and redevelopment operations.

Payment for the actual hours of downhole well cleaning and re-development operations will be made at the unit price listed in the Bid Schedule form. No payment shall be made for equipment acquisition, setup, installation or tear-down. No payment shall be made for installation of the development water conveyance structures. No payment shall be made for management and disposal of sediment, cuttings, scale, cleaning fluids, and produced water. The cost for these items should be included in the on-site hourly rate and mobilization charges.

END OF SECTION

SECTION 01450

TESTING AND PROCESS CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section defines the responsibility of the Developer or Contractor to adequately test native materials and construction materials, and to furnish the Engineer with manufacturer's certifications of material quality.

1.02 QUALITY ASSURANCE

A. The developer or Contractor shall be responsible for all sampling, delivery of samples to a qualified testing agency, testing, and delivery of test results or materials certifications to Engineer at no charge to the Engineer. Testing and certifications reports shall be approved by the Engineer as to conformance to construction specifications prior to final inspection and/or acceptance by the Engineer of any materials or workmanship.

1.03 SUBMITTALS

A. Field Test Report: When possible submit original reports immediately to Engineer or inspector, but in no case later than end of following day.

B. Laboratory Test Report: Submit original report to Engineer within 48 hours after test results are determined.

PART 2 EXECUTION

2.01 SAMPLING

A. Sampling of materials shall be as specified in each test.

B. The Engineer or Inspector may require that sampling be performed in their presence, in which case the Developer or Contractor shall be notified of this requirement in writing at the time the building permit is issued, or at the preconstruction meeting, or when construction drawings are released by the Engineer for construction, as applicable.

C. The presence of an Inspector shall not relieve the Developer/Contractor of any requirement in this Section.

D. Each sample or test shall be accompanied by the following written data, which shall be reported to the Engineer with test results:

1. Name of Project

2. Name of Developer/Contractor

3. Project Street Address

4. Appropriate Test Name

5. Date of Sampling

6. Sample Number (if more than one sample per day)

7. Name of technician who performed the testing

8. Location of sample

2.02 TESTING AGENCY

A. All materials testing, whether in a laboratory or in the field, shall be conducted by a testing agency approved by the Engineer.

2.03 SOIL CLASSIFICATION TEST

A. The soil classification test shall be conducted to determine the suitability of native soils for road subbase and building foundations.

B. The soil classification test shall conform to AASHTO M-146 of latest revision.

C. The soil shall be classified according to AASHTO soil classifications.

D. One soil classification test shall be required for each test area. A test area shall be limited to one parcel of one soil type, a maximum 1,000 feet long and maximum 5 acres.

E. In test areas of less than 2 acres, the Engineer may waive this requirement.

F. The soil sample shall be taken from a test area at a minimum depth of 24 inches below the future design grades, of native soil, and shall be free from foreign material, asphalt, concrete, ice or manmade materials.

G. Where deep footings or pile foundations are proposed, soil classification tests at several depths may be required in each test area.

H. The results of all determinations shall be reported in writing to Engineer.

2.04 COMPACTION TEST OF SOIL AND UNTREATED BASE COURSE

A. Laboratory tests to establish maximum laboratory density shall be determined in accordance with AASHTO T-180, Method D for A-1 classification soils and AASHTO T-99, Method D for all other soils.

B. Samples to determine laboratory density shall be taken from the stockpiled backfill or from the uncompacted base course in place.

C. The acceptance of soil and base course with respect to compaction, shall be based upon the average density of all density tests made in a lot.

1. Field density tests shall be as specified by AASHTO T-191 or by use of a portable nuclear density testing device. Field density tests shall be taken at a depth equal to ½ the maximum depth of the lift tested.

2. A lot shall equal the amount of soil or untreated base course compacted in each production day.

3. A test lot shall be divided into sublots and one density test shall be taken within each sublot.

4. The location of sampling sites within the sublot shall be chosen on a random basis by use of a suitable random number table.

5. Each test lot shall have a minimum of two (2) sublots. A sublot shall be no larger than 1,000 cubic yards for embankment, no larger than 200 cubic yards for backfill over pipe or against structures and no larger 1,000 tons for untreated road base.

D. The test results of all samples tested shall be reported to the Engineer. A test lot shall be accepted when the average of the density determinations is not less than the density required for that improvement in these specifications and when no one density determination is less than 95% of the density required by these specifications.

E. Compaction tests not conforming to required specifications may be rejected and recompaction or related construction efforts to obtain compaction shall be at the Developer's expense.

2.05 TEST ROLL OF ROADWAY SUBGRADE

A. Roll Test shall be performed when required by Engineer to determine the structural integrity of the subgrade and street section.

B. The Roll Test shall be performed as follows:

1. The contractor shall provide a loaded 10 wheel dump truck or water truck to drive over the subgrade material within the roadway.

2. The loaded truck shall be driven slowly over the subgrade to locate soft spots in the subgrade surface.

3. Soft spots in the subgrade shall be identified and marked by the Engineer.

4. It shall be the developer's responsibility to remove the rejected subgrade material to depth determined by Engineer. The rejected material shall be replaced with A-1 granular backfill approved by Engineer.

2.06 GRADATION TEST OF UNTREATED BASE COURSE

A. The gradation of untreated base course shall be determined in accordance with AASHTO T-27.

B. The total amount of material passing the No. 200 sieve shall be determined by washing in water in accordance with AASHTO T-11.

C. The acceptance of road base with respect to gradation shall be based upon the average of all determinations in a lot. A lot shall be limited to one source of borrow and limited to one subdivision plat or one development. One sample shall be required for each 1,000 tons of untreated base course in a test lot. When the test lot is less than 100 tons, the requirement for the gradation test may be waived by the Engineer.

D. The location of sampling sites within a test lot shall be chosen on a random basis by a suitable random number table.

E. All material not conforming to the specified gradations may be rejected at the Developer's expense.

2.07 EXTRACTION - GRADATION TESTING OF BITUMINOUS SURFACE COURSE

A. Samples of the bituminous surface course or asphalt concrete shall be tested with respect to gradation and bitumen content in accordance with Utah Department of Highways Test Procedure 8-946 and 8-947 if required by the Engineer.

B. Mix design shall be submitted to the Engineer for approval 5 working days before work is to begin.

C. Acceptance of bituminous surface course with respect to gradation and bitumen content shall be based upon the average of the determinations made in a lot.

1. A lot shall equal the amount of bituminous surface course placed in each production day.
2. When a lot exceeds 1,000 tons, a minimum of three (3) samples shall be taken in each lot.
3. When a lot is 1,000 tons or less, a minimum of two (2) samples shall be taken.
4. Samples shall be taken at the time of lay-down of bituminous surface course and before compaction. Samples shall be taken from the mat behind the lay-down machine.
5. Sampling shall be timed to represent the entire production day. The time of day, date of sample, station and offset location shall be clearly marked with the sample.
6. If the average asphalt is less than 2.5% of optimal content, the Contractor may be required to lay an additional lift or slurry seal, based on the Engineer's recommendation.

2.08 COMPACTION TESTING OF BITUMINOUS SURFACE COURSE

A. Laboratory tests to establish the maximum laboratory density of bituminous surface course shall be determined by the "Marshall Test" in accordance to ASTM D-1559.

B. Samples to determine maximum laboratory density shall be taken at the time of lay-down of bituminous surface course and before compaction.

C. Acceptance of bituminous surface course with respect to compaction shall be based upon the average determination of field density tests made in a lot.

1. Field density tests shall be by a portable nuclear density testing device or by laboratory density analysis of core samples.

2. A test lot shall be the quantity of surface course placed and compacted in each construction day.

3. The test lot shall be subdivided into sublot(s) of approximately equal size and no larger than 1,600 square yards in area.

4. One field density test shall be taken in each sublot, randomly located in the test lot by use of a suitable random number table.

D. The test lot shall be accepted with respect to density when the average of all density determinations is not less than the density required by Section 02504.

E. Core Tests

1. Acceptance of the completed bituminous surface course with respect to thickness shall be based on the average thickness of a test lot.

a. A test lot shall equal approximately 4,000 square yards of completed roadway.

b. A lot shall be divided into sublots of approximately 2,000 square yards.

2. One thickness test, randomly selected by use of a random number table, shall be taken within each sublot. A minimum of three core tests will be taken.

3. A lot shall be accepted when the average thickness of all sublots is not less than 3/8 inch the total designated bituminous surface course thickness and when no individual sublot shows a deficient thickness of more than ½ inch.

4. Lots or sublots that are not acceptable because of deficient thickness shall be brought into compliance by placing additional surface course as directed by the Engineer.

5. The removed core will be replaced with low strength concrete.

2.09 COMPRESSIVE STRENGTH TESTING OF CONCRETE CYLINDERS

A. Samples of concrete shall be taken at the construction site, molded in standard cylinder shapes, allowed to cure, and tested with respect to comprehensive strength when required by the Engineer.

B. All samples of concrete shall be taken in conformance to AASHTO T-141 of the latest revision.

C. Acceptance of concrete with respect to compressive strength shall be based upon the average determination of all "strength tests" made in a lot.

1. A test lot shall be the quantity of concrete placed at one job in a construction day.

2. For each 50 cubic yards of concrete in a test lot, three (3) compressive "strength tests" shall be run, except that for lots of less than 5 cubic yards, the number of "strength tests" per lot shall be the average strength of three standard cylinders.

3. The making, curing and compressive strength testing of concrete cylinders shall conform to AASHTO T-22 and AASHTO T-23.

D. Concrete may be rejected if desired strengths are not obtained at the Developer's expense.

2.10 ADDITIONAL CONCRETE TESTING

A. Slump Test: Determine slump in accordance with AASHTO T-152.

B. Air Test: Determine normal weight concrete air content; AASHTO T-152 and light weight concrete air content; AASHTO T-196.

C. When requested by Engineer, test concrete in place by impact hammer, sonoscope, or other nondestructive device:

1. To determine relative strengths in various locations in Work.

2. To aid in evaluating concrete strength.

3. To select areas to be cored.

2.11 CERTIFICATIONS FOR WATER SYSTEM VALVES

A. In certain water system equipment, steel items and pipe listed below, a manufacturer's certificate shall be furnished with each unit of equipment, certifying conformance to the applicable requirements of Standard Specifications:

1. Gate Valves

2. Butterfly Valves

3. Steel Reinforcing Bars

4. Structural Steel

5. Corrugated Metal Pipe

6. Polyvinyl Chloride Pipe

7. ABS Composite (Truss) and Solid Wall Pipe

2.12 SUMMARY TABLE OF TESTS AND CERTIFICATIONS

A. The following is a summary of the tests, number of samples per test and certificates that are required for construction work. This summary is provided as a reference guide. For details governing each item, refer to the appropriate test specification herein.

Test Subject	Specific Test	Number of Tests
Soil Classification	AASHTO M-145	1 test per test area of uniform soil type and 5 acres maximum.
Compaction of Soil & Base Course	Lab Density- AASHTO T-99 Method D or AASHTO T-180 Method D	As needed to establish laboratory density
	Embankment & Base Course Field Density- Portable Nuclear Equipment or AASHTO T-191	1 test plus minimum one test per 1,000 cu.yds.
	Backfill Field Density- Portable Nuclear Equipment or AASHTO T-191	1 test plus minimum one test per 200 cu.yds.
Base Course Gradation	Sieve Analysis- AASHTO T-27 Passing No. 200 Sieve- AASHTO T-11	1 test per 1,000 tons
Extraction-Gradation Test of Bituminous Surface Course	UDOT Test Procedure 8-946 & 8-947	3 tests per pavement construction day
Compaction of Bituminous Surface Course	Lab Density- Marshall Test, ASTM D-1559	1 test per pavement construction day
	Field Density- Portable Nuclear Equipment	1 test per 1600 square yards sublot
Core Tests	4" Core Sample	1 thickness test per 2,000 square yards or 3 test minimum
Concrete Test Cylinders	AASHTO T-23	3 cylinders per 50 cubic yards or minimum of 3 cylinders on placements less than 50 cubic yards
Pressure Reducing & Regulating Valves	Manufacturer's Certificate	1 for each valve
Gate Valve	Manufacturer's Certificate	1 for each valve over 12" diameter
Butterfly Valves	Manufacturer's Certificate	1 for each valve
Steel Re-Bar	Manufacturer's Certificate	1 for each 1,000 pounds of one grade
Structural Steel	Manufacturer's Certificate	1 for each lot of one shape, one grade
Corrugated Metal Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class
Polyvinyl Chloride Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class

Test Subject	Specific Test	Number of Tests
A.B.S. Pipe	Manufacturer's Certificate	1 for each 500 lineal feet of one size, one class

END OF SECTION

SECTION 02150

SHORING AND UNDERPINNING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shoring for open excavations requiring a protective system.

1.02 REFERENCES

A. OSHA Construction Standards Chapter P: Excavations, Trenching, and Shoring.

1.03 RESPONSIBILITY

A. Contractor is solely responsible for safety. It is the Contractor's responsibility to adhere to all of OSHA's current regulations.

1.04 DEFINITIONS

A. Accepted Engineering Practices: Those requirements or practices which are compatible with standards required by a duly licensed or recognized authority.

B. Benching: A method of protecting persons and property against cave-ins by excavation the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

C. Excavation: Any man-made cut, cavity, or depression in an earth surface, including trenches, formed by earth removal and producing unsupported earth conditions (sides). If installed forms or similar structures reduce the depth-to-width relationship, and excavation may become a trench.

D. Failure: The permanent deformation or breakage of a structural member or connection; or the collapse of all or part of an excavation.

E. Protective System: Any recognized method of protecting persons and property against cave-ins, the collapse of adjacent structures, or material that may fall or roll from an excavation side or into and excavation. Protective systems include support systems, sloping and benching systems and shield systems.

F. Shield/Trenchbox : A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect persons and property within the structure without preventing a cave-in. Shields may be permanent structures or may be designed to be portable and moved along as work progresses. Portable shields used in trenches are usually referred to as "trench boxes" or "trench shields".

G. Shoring: A structure that supports the sides of an excavation and thereby protects persons and property by preventing cave-ins.

H. Sides: A vertical or inclined earth surfaces formed at the outer edges of an excavation.

I. Sloping: A method of protecting persons and property against cave-ins by excavation to form sides that are inclined away from the excavation, the angle on incline being of such a degree for the conditions of exposure that a cave-in will not occur.

J. Support System: A structure which protects persons and property by providing support to an adjacent structure, underground installation, or the sides of an excavation.

K. Trench: A narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

1.05 DESIGN OF PROTECTIVE SYSTEMS

A. Use professional engineer to design support systems, shield systems, and the structural components of these systems, and sloping and benching systems to resist without failure all loads that are intended to be imposed or transmitted to them.

B. Fully compensate in design procedures for hydrostatic pressure in the excavation sides.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials shall be as per 1.05 of this section

PART 3 EXECUTION

3.01 STABILITY OF ADJACENT STRUCTURES

A. Use support systems such as shoring, bracing, or underpinning where stability of adjoining buildings, walls, sidewalks, pavements, or other structures is endangered by excavation operations.

3.02 INSPECTIONS

A. Contractor shall employ and have on site at all times a competent person, as defined be OSHA, who is responsible for excavation inspection.

B. Inspect excavations daily for evidence of possible cave-ins, indications of failure of protective systems, or other hazardous conditions.

C. Upon discovery of hazardous conditions, cease all work in the excavations until additional precautions have been taken to ensure persons and property safety.

3.03 ADDITIONAL REQUIREMENT FOR TRENCH EXCAVATION

A. Do not excavate material to a level greater than 2 feet below the bottom of the members of a support system if the system is designed to resist the forces calculated for the full depth of the trench, and indications of a possible cave-in below the bottom of the support system are not evident while the trench is open.

END OF SECTION

SECTION 02205

COMMON FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Common fill material requirements.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

B. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.03 DEFINITIONS

A. Common Fill: Backfill material which is <u>not</u> mechanically graded.

1.04 ACCEPTANCE

A. Acceptance of common fill shall be determined by Engineer and based upon 1 sublot of 500 tons plus any additional sublots for each 500 tons or portion thereof over and above the first 500 tons of each common fill placed in any 1 week.

B. Engineer reserves the right to select and test backfill on a random basis from any location in the Work, on the site or from the backfill source.

PART 2 PRODUCTS

2.01 BORROW/GRANULAR FILL (AASHTO TYPE A-1-a)

A. Bank run material: free of shale, clay, slag, friable material and debris.

B. The material must be within the following limits:

Sieve Size	Percent by Weight Passing Sieve
4 inches	99
No. 4 (4.75 mm)	30 to 70
No. 200 (75 micro m)	3 to 15

2.02 NATIVE MATERIAL

A. Sound, earthen material with 95% passing the 4 inch sieve.

B. Percent of material by weight passing Number 200 sieve shall not exceed 20%when tested in accordance with AASHTO T-27.

2.03 SAND

A. Clean, coarse, natural sand.

B. Non-plastic when tested in accordance with ASTM D 4318.

C. 100 percent shall pass a ½ inch screen.

D. No more than 20 percent shall pass a number 200 screen.

2.04 SOURCE QUALITY CONTROL

A. Verify gradation compliance in accordance with AASHTO T-27. Select samples uniformly in time on a random basis.

PART 3 EXECUTION

3.01 INSTALLATION

A. Excavation and Backfill Operations: In accordance with Section 02225.

END OF SECTION

SECTION 02206

SELECT FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Select fill material requirements.

1.02 REFERENCES

A. AASHTO T-96: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

B. AASHTO T-27: Standard Method for Sieve Analysis of Fine and Coarse Aggregates.

1.03 DEFINITIONS

A. Select Fill: Backfill material which is mechanically graded.

1.04 SUBMITTALS

A. Material analysis of each select fill material to be used.

1.05 ACCEPTANCE

A. Engineer reserves the right to select, reject, and test backfill on a random basis from any location in the Work or from the backfill source.

PART 2 PRODUCTS

2.01 AGGREGATES

A. Clean, hard, tough, durable and sound mineral aggregates that consists of 95% crushed stone, crushed gravel or crushed slag; free of deleterious and organic matter; and complies with the following:

1. Aggregate Wear Under AASHTO T-96: Less than 50 percent.

2. Material shall be classified as A-1 material.

3. Aggregates - master grading band limits

a. The following limits are based on fine and course aggregate having approximately the same bulk specific gravities. The limits are wider than necessary for good job control. Sieve gradations are based upon percent of aggregate passing by weight in accordance with AASHTO T-27.

MASTER GRADING BAND LIMITS						
Sieve Size	UNTREATED BASE COURSE Type 1		Type 3/4		PEA GRAVEL	
	Min	Max	Min	Max	Min	Max
1-1/2"	--	--	--	--	--	--
1"	100	--	--	--	--	--
3/4"	--	--	100	--	--	--
½"	79	91	--	--	--	--
3/8"	--	--	78	92	--	--
No. 4	49	61	55	67	100	--
No. 16	27	35	28	38	--	3
No. 200	7	11	7	11	--	2

2. Source quality control
    a. Verify job-mix grading band material compliance in accordance with AASHTO T-27. Select samples uniformly in time on a random basis.

2.02 DRAIN ROCK

A. Consist of hard, durable particles of stone or gravel, screened or crushed to specified size and gradation.

B. Free from vegetable matter, lumps or balls of clay, or other deleterious matter.

C. Crush or waste coarse material and waste fine material as required to meet gradation requirements.

D. Durability Index: Percentage of wear not greater than 40 percent when tested in accordance with AASHTO T-96.

E. Conform to size and grade within the limits as follows when tested in accordance with AASHTO T-27.

	¾ " Drain Rock	1-1/2" Drain Rock	3" Drain Rock
SIEVE SIZE (Square Openings)	PERCENT BY WEIGHT PASSING SIEVE	PERCENT BY WEIGHT PASSING SIEVE	PERCENT BY WEIGHT PASSING SIEVE
4 inch	100	100	100
3 inch	100	100	95-100
2 inch	100	100	50-100
1-1/2 inch	100	95-100	15-55
3/4 inch	95-100	50-100	0-20
3/8 inch	15-55	15-55	0-15
Number 4	0-10	0-25	0-10
Number 8	0-5	0-5	0-5
Number 200	0-2	0-2	0-2

2.03 GRAVEL

A. Consist of hard, durable particles or fragments of stone or gravel, screened or crushed to specified sizes and gradations.

B. Free from vegetable matter, lumps or balls of clay, alkali, adobe, or other deleterious matter.

C. When sampled and tested in accordance with specified test methods, material shall comply with the following requirements:

1. Durability index: Percentage of wear not greater than 40 percent after 500 revolutions when tested in accordance with ASTM C 131.

2. Plasticity Index: Not greater than 5 when tested in accordance with ASTM D 4318.

3. Liquid limit: Not greater than 25 percent when tested in accordance with ASTM D 4318.

D. Conform to sizes and grade within the limits as follows when tested in accordance with ASTM C 136 and ASTM C 117:

Sieve Size (Square Openings)	Percent By Weight Passing Sieve
3 inch	--
1-1/2 inch	100
Number 4	30-70
Number 8	20-60
Number 30	10-40

Number 200	0-12

SAND

A. Friable river or bank aggregate, free of loam and organic matter. Graded as follows.

SIEVE	PERCENT PASSING BY WEIGHT
3/8 inch	100
Number 100	1-10

PART 3 EXECUTION

3.01 INSTALLATION

A. Excavation and Backfill Operations: In accordance with Section 02225.

END OF SECTION

SECTION 02225

EXCAVATION AND BACKFILL OPERATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for trenching and backfilling for underground pipelines.

B. Excavating and backfilling operations adjacent to and under structures including boxes, headwalls, or other structures as required by Engineer.

C. Backfilling and compacting operation for construction and reconstruction of roadways, embankments, streets, parking lots, and other paved surface areas.

D. Excavation permit requirements.

1.02 DEFINITIONS

A. Pipe Zone: That zone in an excavation which supports, surrounds, and extends to 1 foot above the top of the pipe barrel.

B. Bedding: Process of preparing the trench bottom to receive the pipe and the backfilling on each side of the pipe to 12 inches over the top of the pipe.

C. Roadway: Area within the street right-of-way, including the area under the street, curb, gutter, and one (1) foot behind curb.

1.03 SUBMITTALS

A. Cut Sheets: In accordance with Section 00700.

B. Material Analysis Reports: In accordance with Sections 02205 or 02206 as applicable.

C. Density Test Reports: In accordance with Section 02250.

D. Depth of backfill lift. This information shall be contingent upon type of equipment used in compaction operation. Engineer may order lesser thickness if compaction is not achieved.

1.04 STORAGE AND HANDLING

A. Stockpile excavated material in a manner as to cause a minimum of inconvenience to public travel and provide for emergency traffic as necessary.

B. Maintain free access to all existing fire hydrants, water and gas valves, and meters.

C. Maintain clearance for free flow of storm water in all gutters, conduits, and natural water courses.

D. Utilize appropriate traffic signs, markers, and procedures in all product storage and handling activities.

E. Promptly remove all other material from site.

1.05 SITE CONDITIONS

A. Unsuitable Weather Limitations: Do not place, spread, or roll any fill material during unsuitable weather conditions. Do not resume operations until moisture content of material is satisfactory.

B. Protection of Graded Areas: Protect graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or unsuitable weather, scarify surface, reshape, and compact to required density prior to further construction.

D. Prior to excavation operations, photograph existing surfaces along which Work may take place in order to determine, after construction is completed, whether any damage of existing improvements occurred prior to construction operations.

E. Grading: In compaction operations, do not vary the surface of finished aggregate base course more than 1/4" above or below grade.

PART 2 PRODUCTS

2.01 WATER

A. Make arrangements for source of water during construction and make arrangements for delivery of water to site. Comply with all local laws and regulations when securing water from water utility company.

2.02 SOIL MATERIALS

A. Over-excavation Fill: Select Fill: in accordance with Section 02206.

B. Common Fill: in accordance with Section 02205.

C. Select Fill: in accordance with Section 02206.

D. Native Backfill:

1. When approved by Engineer, native backfill material obtained from project excavations may be used as backfill, provided organic material, rubbish, debris, rocks larger than 8 inches, and other objectionable materials are removed.

2. Bituminous pavement obtained from project excavations will not be permitted as backfill except for the following:

a. May be mixed with road subbase if material meets section 02205.2.01 gradation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify areas to be backfilled are free of debris, snow, ice, or water and ground surfaces are not frozen.

B. Verify foundation of basement walls are braced to support surcharge forces imposed by backfilling operations.

C. Immediately prior to suspension of construction operations for any reason, provide proper and necessary drainage of work area.

3.02 PREPARATION

A. For pipelines, use means necessary to avoid displacement, and injury to, pipe and structures while compacting soil or operating equipment next to pipeline.

B. Movement of construction machinery over a pipeline at any stage is solely at Contractor's risk.

C. When excavation is required, satisfy all conditions of the appropriate agencies.

D. Identify required lines, grades, contours, and benchmarks.

E. Notify all affected utility companies and Blue Stakes prior to commencing excavation operation.

F. Support and protect from damage, until completion of the Work, any existing facilities and structures which exist in, pass through, or pass under the site.

3.03 CONTROL OF GROUNDWATER

A. All trenches shall be kept free from water during excavation, fine grading, pipe laying, jointing, and embedment operations.

B. Where the trench bottom is mucky or otherwise unstable because of the presence of groundwater, and in cases where the static groundwater elevation is above the bottom of any trench or bell holed excavation, such groundwater shall be lowered to the extent necessary to keep the trench free from water and the trench bottom stable when the work within the trench is in progress.

3.04 SHORING

A. Comply with Section 02150 when required by field condition.

3.05 GENERAL EXCAVATION OPERATIONS

A. If topsoil is on site, remove and store it for later use on site.

B. Excavate site to required grade for Work. Use all means necessary to control dust on or near Work and on or near all off-site borrow and disposal areas.

C. Notify Engineer of unexpected subsurface conditions.

D. Underpin adjacent structure which may be damaged by excavation work, including service utilities and pipe chases.

E. If unstable material is encountered at the bottom or face of excavation, do not perform extra excavation without Engineer's written approval. Correct unauthorized extra excavations at no cost to Owner.

F. Provide necessary protection to excavation walls as required. If conditions permit, slope excavation side to maintain a safe and clean working area. Remove loose materials.

G. Correct excavation beyond the specified lines and grades by filling the resulting voids with approved compacted fill. If the fill is to become the subgrade for other fill, use material approved by Engineer. Do not proceed until Engineer has approved the material and the proposed method of backfilling for over excavation errors.

3.06 EXCAVATION FOR PIPELINES

A. Trenches shall be excavated to the depths and widths required to accommodate the construction of the pipelines, as follows:

1. Except in ledge rock, cobble rock, stones or water saturated earth, mechanical excavation of trenches shall not extend below an elevation of 4 inches below the bottom of the pipe after placement in its final position.

2. All additional excavation necessary for preparation of the trench bottom shall be made manually.

3. Excavation for trenches in ledge rock, cobble rock, stones, mud or other material unsatisfactory for pipe foundation, shall extend to a depth of at least 4 inches below the bottom of the pipe.

4. A bedding of special material shall be placed and thoroughly compacted with pneumatic tampers in 4-inch lifts to provide a smooth, stable foundation.

5. Special foundation material shall consist of suitable earth material free from roots sod or vegetable matter.

6. Trench bottoms shall be hand shaped as specified in paragraph (2) above.

7. The maximum width of trench, measured at the top of the pipe, shall be as narrow as possible but a minimum of 6 inches on each side of the pipe.

8. Where ground water is encountered, clay dikes and/or filter fabric may be required at a minimum of 100 feet or as directed by the Engineer.

B. Grade bottom of trenches to provide uniform bearing surface.

C. If necessary, make bellholes and depressions required to complete joining of pipe or box.

D. In public thoroughfares and regardless of trench depth, safely barricade and limit open trenches to a maximum of 200 lineal feet in the daytime, except in traveled roadways where a maximum of 80 lineal feet of open trench will be allowed.

E. Close trenches during nighttime conditions.

3.07 GRAVEL FOUNDATION FOR PIPE

A. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load; where water must be drained to maintain a dry bottom for pipe installation and at other locations as previously defined, the subgrade shall be excavated to a minimum of 12 inches and replaced with crushed rock or gravel.

B. Gravel for pipe foundations shall conform Drain Rock in Section 02206.

C. Drain Rock material shall be deposited over the entire trench width in 18-inch maximum layers, each layer shall be compacted by tamping, rolling, or vibrating.

D. The material shall be graded to produce a uniform and continuous support for the installed pipe.

3.08 BACKFILLING FOR PIPELINES

A. Backfill shall be carefully placed around and over pipes and shall not be permitted to fall directly on a pipe from such a height, or in such a manner as to cause damage.

B. Bedding requirements are as defined in the Specifications for each specific pipe material.

C. Trench backfilling above the level of the pipe bedding shall normally be accomplished with A-1 material. Native excavated materials shall be free from rocks larger than 8-inches in diameter.

D. Compaction Requirements

1. Under pavements, shoulders, or other surface improvements the in-place density shall be a minimum of 95% of laboratory standard maximum dry density as determined by AASHTO T-99.

2. In other areas the in-place density shall be a minimum of 92% of the maximum dry density as determined by the same laboratory method

E. Clay cut off dikes shall be constructed as required by Engineer.

3.09 STRUCTURAL EXCAVATION

A. Provide all required shoring, cribs, cofferdams, and caissons including all pumping, bailing, draining, sheathing, bracing, and related items.

B. If conditions permit, slope excavation sides as excavation progress to maintain a safe and clean working area as required by OSHA.

C. Support excavation. Do not interfere with the bearing of adjacent foundations, pipelines, etc.

D. All unauthorized excavation below the specified structure subgrade shall be replaced with concrete, monolithic with that of the slab above or with coarse gravel thoroughly compacted into place.

E. Subgrade soil for all concrete structures shall be firm, dense, thoroughly compacted, and consolidated.

F. Subgrade soil shall be free from mud and muck; and shall be sufficiently stable to remain firm and intact under the feet of the workmen engaged in subgrade surfacing, laying reinforcing steel, and depositing concrete.

G. Coarse gravel or crushed stone may be used for subsoil reinforcement if results satisfactory to the Engineer can be obtained thereby.

   A. Material shall be applied in lifts of 6" or less.

   B. Each lift shall be embedded in the subsoil by thorough tamping.

   C. All excess soil shall be removed to compensate for the displacement of the gravel or crushed stone and the finished elevation of any subsoil reinforced in this manner shall not be above the specified subgrade.

3.10 BACKFILLING FOR STRUCTURES

A. Do not fill adjacent to structures until approval is obtained from Engineer.

B. All forms shall be removed and the excavation shall be cleaned of all trash and debris.

C. Backfill areas to contours and elevations indicated. Do not use frozen materials.

D. Do not use compaction equipment adjacent to walls or retaining walls that may cause wall to become overstressed or moved from final alignment.

E. Place select fill a minimum of 3 feet around the outside of structures.

F. Place and compact select fill materials in continuous lifts not exceeding 12" loose depth.

G. Place and compact common fill material in continuous lifts not exceeding 8" loose depth.

H. Do not disturb or damage foundation perimeter drainage, foundation, dampproofing, foundation waterproofing and protective cover, or utilities in trenches.

I. Backfill against foundation walls simultaneously on each side. Do not backfill against walls until concrete has obtained 7 day strength.

J. Make smooth changes in grade. Blend slopes into level areas.

K. Remove surplus backfill materials from site.

L. Leave stockpile areas completely free of excess fill materials.

M. Slope grade away from structure at a minimum of 3" in 10 feet unless otherwise indicated.

N. Compaction: Each layer of material shall be compacted by hand or machine tampers or by other suitable equipment to a density equal to 95% of maximum dry density as measured by AASHTO T-99.

O. Restore any damaged structure to its original strength and condition and rebackfill to specifications.

3.11 ROADWAY EXCAVATIONS

A. In advance of setting line and grade stakes, clean subgrade area of brush, weeds, vegetation, grass, and debris. Drain all depressions or ruts which contain water.

B. A soils classification, as determined by AASHTO T-27, shall be made on the proposed subgrade, and the following shall be required based on that classification, or as approved by the Engineer.

Road Subgrade Preparation Schedule

Soil Classification	Requirement
A-1	The subgrade shall be scarified to a depth of 12" and the loosened material shall be moistened and compacted to the equivalent of 95% of maximum dry density as measured by AASHTO T-99.
A-2,A-3 A-4 or A-5	The subgrade shall be over-excavated a minimum of 12" subgrade scarified and compacted, replaced with A-1 granular material, and be moistened and compacted as above.
A-6 or A-7	The subgrade shall be over-excavated a minimum of 18" subgrade scarified and compacted, replaced with A-1 granular material, and be moistened and compacted as above.

C. No organic material, soft clay, spongy material, or other deleterious material will be permitted in the scarified or imported subgrade layer.

D. Rough subgrades shall be shaped and graded to within a tolerance of 0.15 feet of design grade and drainage shall be maintained at all times.

E. Moisture content of the subgrade layer shall be maintained at not less than 95% or more than 105% of optimum moisture content, during the compaction process. The entire roadbed, to one foot in back of curb, must be compacted to the specified density to a minimum depth of 8 inches.

F. If removal of boulders, rubble, or existing improvements, found within the excavated area results in a lower excavation elevation than indicated, backfill over excavation in a manner approved by Engineer.

G. Remove all deposits susceptible to frost heave.

H. Excavations through or under streets, sidewalks, street shoulders, driveways, etc. shall comply with the following requirements:

1. Material removed by excavation is not to be used as backfill or placed back into the trench under any paved portion of the street. However, sand may be used for backfill up to one foot above top of pipe.

2. The remaining trench shall be filled with select fill as per section 02206.

3. The trench shall be filled to the existing asphalt level and guarded from traffic until set.

4. Within 10 days of the fill, sufficient fill material shall be removed and replaced with material comparable to the adjacent surface material shall meet the requirements of Section 02504 of these specifications.

5. The Engineer shall inspect all work.

3.12 SUBGRADE PREPARATION

A. Compact subgrade surfaces to density specified for overlying backfills. Refer to Section 02250.

B. If areas of subgrade not readily capable of in-situ compaction, secure Engineer's authorization for extra excavation and backfill.

C. Maintain minimum overburden cover of 2 feet over pipelines or conduits during subgrade preparation.

3.13 BACKFILLING FOR PAVEMENT

A. Before beginning backfilling operations obtain Engineer's approval of excavation operation.

B. Do not damage subsurface structures or service lines.

C. Process backfill and avoid segregation. Keep base course free from pockets of coarse or fine material.

D. Deposit base course on the roadbed in a uniform manner which will provide the required compacted thickness. Maintain moisture content.

E. Shoulders are an integral part of the embankment. Do not build shoulders to a grade higher than that of the adjacent granular base course. Maintain efficient surface runoff at all times.

F. Compaction: in accordance with Section 02250.

G. Prior to placing pavements, proof roll in accordance with Section 01450.

3.14 BLASTING

A. Blasting will not be allowed except by permission from the Engineer.

1. The Contractor shall comply with all laws, ordinances, and applicable safety code requirements and regulations relative to the handling, storage, and use of explosives and protection of life and property.

2. And he shall be fully responsible for all damage attributable to his blasting operations.

3. Excessive blasting or overshooting will not be permitted and any material outside the authorized cross-section which may be shattered or loosened by blasting shall be removed by the Contractor.

3.15 COMPACTION OF BACKFILL

A. In accordance with Section 02250.

3.16 IMPORTED BACKFILL MATERIAL

A. In the event the native excavated material is not satisfactory for backfilling as determined by the Engineer, the Contractor shall provide imported granular fill in accordance with Section 02205.

3.17 DISPOSAL OF EXCESS MATERIALS

A. All excess material shall be hauled away from the construction site and disposed of by the Contractor.

END OF SECTION

SECTION 02250

SOIL COMPACTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Compaction control of native and imported backfill material.

1.02 REFERENCES

A. AASHTO M 145: Recommended Practice for the Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

B. AASHTO T-99: Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49-kg) Hammer and 12-In. (305-mm) Drop.

C. AASHTO T-180: Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using a 10-lb (4.54-kg) Hammer and an 18-In. (457-mm) Drop.

D. AASHTO T-238: Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.03 DEFINITIONS

A. A-1 Soils: AASHTO M 145 describes the nature of these soils.

B. Modified Proctor: The test method used for moisture-density relationship of soils as determined by the ASTM D 1557 test method.

C. Percent Compaction or Percent Density: The ratio of the field dry density to the laboratory maximum dry density expressed as a percentage.

D. Standard Proctor: The test method used for moisture-density relationship of soils as determined by the ASTM D 698 test method.

1.04 WARRANTY

A. Correct deficient conditions. Replace or repair surfacing materials and damaged facilities.

B. The method of construction repair shall be proposed in writing by Contractor for approval by Engineer prior to correcting the failed condition.

C. Failure to detect any defective work or material does not prevent later rejection of the work nor obligate Engineer for final acceptance when such defective work or material is discovered.

PART 2 EXECUTION

2.01 COMPACTION REQUIREMENTS

A. The Contractor shall be responsible to perform and pay for all testing of earth materials.

B. Moisten or de-water backfill material to obtain optimum moisture for compaction compliance.

C. The material shall be deposited in horizontal layers having a compacted thickness of no more than 12 inches for roadway and 6 inches for trenches.

D. The distribution of materials shall be such that the compacted material will be homogeneous and free from lenses, pockets, or other imperfections.

E. The material shall have the optimum moisture content required for the purpose of compaction and the moisture content shall be uniform throughout the layer, insofar as practicable.

F. Backfill shall be compacted by means of sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers of a size and type approved by the Engineer.

G. If the required relative density is not attained, test sections will be required to determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort necessary to attain the specified minimum relative density.

H. Approval of equipment, thickness of layers, moisture content and compactive effort shall not be deemed to relieve the Contractor of the responsibility for attaining the specified minimum relative densities.

I. The Contractor in planning his work shall allow sufficient time to perform the work connected with test sections and to permit the Engineer to make tests for relative densities.

2.02 FIELD QUALITY CONTROL

A. Optimum Soil Density: Unless indicated otherwise.

1. In accordance with AASHTO T-180 Method D test (Modified Proctor).

2.03 COMPACTION UNDER ROADWAYS

A. Fill or embankment material shall be compacted to not less than 95% of maximum dry density as measured by AASHTO T-180.

B. Compaction shall extend one foot beyond proposed curb line.

2.04 COMPACTION UNDER SIDEWALKS, CURB AND GUTTER, AND DRIVEWAYS

A. Fill or embankment material shall be compacted to not less than 95% of maximum dry density as measured by AASHTO T-180.

B. Compaction of material shall extend to at least one foot each side of the edge of the slab.

2.05 COMPACTION OF OTHER FILLS AND EMBANKMENTS

A. Fill or embankment materials other than those mentioned above shall be compacted to not less than 92% of maximum dry density as measured by AASHTO T-180.

END OF SECTION

SECTION 02512

RESTORATION OF SURFACE IMPROVEMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Restoration of surface improvement requirements

1.02 GENERAL IMPROVEMENT REQUIREMENTS

A. The Contractor shall be responsible for the protection and the restoration or replacement of any improvements existing on public or private property at the start of work or placed there during the progress of work.

B. Existing improvements shall include but are not limited to permanent surfacing, curbs, ditches, driveways, culverts, fences and walls. All improvements shall be reconstructed to equal or better, in all respects, to the existing improvements removed.

PART 2 PRODUCTS

A. Select Fill: In accordance with Section 02206.

B. Asphalt Concrete: In accordance with Section 02510.

C. Concrete: In accordance with Section 03304.

PART 3 EXECUTION

3.01 ROAD BASE REPAIR

A. Where trenches are excavated through gravel surfaced areas such as roads and driveways, etc., the gravel surface shall be restored and maintained as follows:

1. The gravel shall be placed deep enough to provide a minimum of 6-inches of material.

2. The gravel shall be placed in the trench at the time it is backfilled. The surface shall be maintained by blading, sprinkling, rolling, adding gravel, etc., to maintain a safe uniform surface satisfactory to the Engineer. Excess material shall be removed from the premises immediately.

3. Material for use on gravel surfaces shall be obtained from sound tough durable gravel or rock meeting the requirements of Section 02206.

3.02 BITUMINOUS SURFACE REPAIR

A. Where trenches are excavated through bituminous surfaced roads, driveways or parking areas, the surface shall be restored and maintained as follows:

1. Trenches shall be backfilled with untreated base course from the pipe bedding to match existing asphalt thickness with a minimum thickness of 3 inches.

2. Pavement restoration shall include priming of pavement edges with bituminous material and placing and rolling plant mix bituminous material to the level of the adjacent pavement surfaces.

3.03 CONCRETE REPAIR

A. All concrete curbs, gutter, sidewalks, and driveways shall be removed and replaced to the next joint or scoring lining beyond the actually damaged or broken sections.

B. In the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be saw cut, removed, and reconstructed to neat, plane faces.

C. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements.

D. Where necessary, lampblack or other pigments shall be added to the new concrete to obtain the desired results.

E. All concrete work shall conform to the requirements of Section 03310 of these Specifications.

END OF SECTION

SECTION 02660

PIPELINE TESTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing requirements for potable and non-potable water piping systems and sanitary sewers.

1.02 DEFINITIONS

A. Leakage: The quantity of water required to maintain the specified hydrostatic test pressure after the pipeline has been filled with water and the air expelled.

B. Non-rigid Pipe: Any pipe which required bedding and backfill material for structural support.

1.03 SUBMITTALS

A. Pipeline Test Report: Include the following items:

1. Type of test.
2. Identification of pipe system.
3. Size, type, location and length of pipe in test section.
4. Test pressure and time.
5. Amount of leakage versus allowable.
6. Date of test approval.
7. Signature of test supervisor.
8. Signature of the Engineer, Inspector, or Water Superintendent witnessing and approving the test.
9. One copy of video tape.

1.04 PROJECT CONDITIONS

A. Repair pipeline system at no additional cost to Owner until it passes subsequent retesting.

B. Recording Equipment:

1. Supply all necessary equipment to perform pressure testing.
2. Secure Owner's approval of pressure gages.
3. Locate all gages and recording equipment away from affect of sunshine or other weather

conditions.

4. Place, vents, pressure taps and drains for the test. Repair pipeline at the completion of the test at no cost to Owner.

PART 2 PRODUCTS

2.01 TESTING MATERIALS

A. Medium: Water or air, as required by test.

B. Equipment: Temporary motors, pumps, pumping apparatus, pressure gages, connections, power, etc. for making the tests.

PART 3 EXECUTION

3.01 PREPARATION

A. Notify Engineer or Water Superintendent 48 hours in advance of test.

B. Carry out tests as pipeline construction progresses to ensure construction methods are producing satisfactory results.

3.02 TESTING FOR PRESSURE PIPELINES

A. Expel all air from the pipeline before applying the specified test pressure. Provide air release taps at points of highest elevations before testing. Insert permanent plugs after test has been completed.

B. A minimum pressure 50 psi in excess of the designated class rating of the pipe being tested shall be maintained on the portion being tested for a minimum period of two hours, using hydraulic means to maintain the pressure.

C. Maximum leakage during the test shall not exceed one-half (½) gallon per inch of diameter per 1000 feet of pipe.

D. Suitable means shall be provided by the Contractor for determining water lost by leakage under the test pressure.

E. Locate and repair the defective joints and retest until the leakage is within the specified allowance.

F. Repair any noticeable leakage even if total leakage is less than allowable.

G. Flushing:

1. After pressure testing all pipelines shall be flushed.

2. Flushing shall be accomplished through hydrants or, if a hydrant does not exist at the end of the line, the Contractor shall install a tap of sufficient size to provide for a 2.5 foot per second flushing velocity in the line.

3. The following is the flow quantity required to provide a 2.5 foot per second flushing velocity:

Pipe Size (In.)	Flow (gpm)
4	100
6	220
8	390
10	610
12	880
16	1567

3.03 ALIGNMENT AND GRADE TEST

A. No variance will be allowed from line and grade in excess of 1/32" per inch of pipe diameter or ½" maximum provided that such variation shall not result in a level or reverse sloping invert.

B. The variation in the invert elevation between adjoining ends of pipe due to eccentricity of joining surface and pipe interior surfaces shall not exceed 1/64" per inch of pipe diameter, or ½" maximum.

3.04 OBSTRUCTION TEST

A. Visually examine pipe internally for obstructions by use high power light or mirror.

B. When required by the Engineer, a round incompressible mandrel which is 1" less in diameter than the internal diameter of the pipeline and 2 times the diameter in length will be passed through the pipeline.

3.05 NON-RIGID PIPE DEFLECTION TEST

A. Test installed sections of non-rigid pipeline to ensure that circumferential deflection of non-rigid pipe does not exceed 5 percent. Use mandrel of proper size.

3.06 INFILTRATION TEST

A. No pipe section will be accepted if the infiltration rate exceeds 100 gallons per inch diameter per mile per 24 hours.

3.07 FLUSHING OF SANITARY SEWERS

A. All sanitary sewer lines shall be flushed and cleared prior to acceptance by the Engineer.

B. Flushing

1. Laterals and trunk lines shall be flushed by water to remove all foreign material.

2. Wastewater and debris shall not be permitted to enter sewer lines in service, but shall be removed at the lowest manhole of the extension.

3. Other methods of cleaning may be used upon approval of the Engineer.

4. After the lines have been thoroughly cleaned, they shall be tested between all manholes for displacement.

3.8 PIPE TESTING SCHEDULE

A. Irrigation:

1. Alignment and grade test.

2. Pressure test.

3. Operational Testing:

a. Perform operational testing after hydrostatic test is complete, backfill is in place and sprinkler heads adjusted to final position.

b. Demonstrate system meets coverage requirements and automatic controls function properly.

c. Coverage requirements are based on operation of 1 circuit at a time.

B. Sub-drains:

1. Alignment and grade test.
2. Obstruction test.
3. Non-rigid pipe deflection test.
4. Pressure test for pressure pipeline systems.

C. Storm Drains:
1. Alignment and grade test.
2. Obstruction test.
3. Non-rigid pipe deflection test.
4. Pressure test for pressure pipeline systems.

D. Potable Water System:
1. Obstruction test.
2. Bacteria test.
3. Pressure Test
4. If pressure test fails and line repaired, the bacteria test is again required.

END OF SECTION

SECTION 02668

WATER TRANSMISSION AND DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

1. Pipe and fittings for culinary water line.
2. Valves, fire hydrants and water meters.

1.02 RELATED SECTIONS

A. Section 02205: Common Fill.

B. Section 02206: Select Fill.

3. Section 02225: Excavating and Backfill Operations.

4. Section 02250: Soil Compaction.

5. Section 02660: Pipeline Testing.

6. Section 02675: Disinfection.

7. Section 03300: Cast-in-Place Concrete: Concrete for thrust restraints.

1.03 REFERENCES

A. ASME B16.18: Cast Copper Alloy Solder Joint Pressure Fittings.

B. ASME B16.22: Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

C. ASTM B88: Seamless Copper Water Tube.

D. ASTM D2241: Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).

E. ASTM D2855: Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and fittings.

F. AWWA C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

G. AWWA C105: Polyethylene Encasement for Ductile Iron Piping for Water and Other liquids.

H. AWWA C110: American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.

I. AWWA C111: Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.

J. AWWA C151: Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

K. AWWA C500: Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.

L. AWWA C502: Dry Barrel Fire Hydrants.

M. AWWA C504: Rubber Seated Butterfly Valves.

N. AWWA C600: Installation of Ductile-Iron Water Mains and Appurtenances.

O. AWWA C900: Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.

P. UL 246: Hydrants for Fire - Protection Service.

1.04 SUBMITTALS

A. Prior to construction submit 6 copies of the manufactures specification for all products to the engineer for approval.

1.05 SUBMITTALS AT PROJECT CLOSEOUT

A. Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.01 DUCTILE IRON WATER PIPE

A. Ductile Iron Water pipe shall be Class 50 for slip-on joint piping (Class 51 for 4-inch size) and Class 53 for mechanical joint and flanged joint piping.

B. All piping shall conform to AWWA Specification C-151 of the latest revision.

C. Pipe joints shall be the push-on rubber gasket type of mechanical joint type with plain rubber gaskets conforming to AWWA C-111 of latest revision or flanged connections conforming to AWWA C-115 of latest revision.

D. All Ductile Iron Pipe wall thicknesses shall conform to AWWA C 150-76.

E. Fittings: Fittings shall conform to AWWA Specification C 110-77 and shall have mechanical or push-on rubber gasket joints.

F. Coatings and Linings for Ductile Iron Pipe

1. All exterior surfaces of pipe and fittings shall be coated with hot coal tar approximately 1 mil thick.

2. All interior surfaces of pipe and fittings shall be coated with the standard thickness cement mortar lining in conformity with the requirements of A.S.A. Standard A21.4.

G. Markings

1. Pipe markings shall include the following, marked continuously down the length:

   a. Manufacturer's Name

   b. Nominal Size

   c. Class Pressure Rating

   d. PVC 1120

   e. NSF Logo

   f. Identification Code

   g. Minimum water main size is 8 inches

2.02 POLYVINYL CHLORIDE PIPE (PVC)

A. All PVC pipe used for transmission lines shall be AWWA C-900, DR-18 or as determined by the Engineer. All PVC pipe used for secondary irrigation lines shall be AWWA C-900, DR-18 Purple pipe or as determined by the Engineer.

B. Conformance: All PVC pipe shall conform to the latest revisions of the following specifications.

1. AWWA Spec. C-900 (PVC pressure pipe for water)

2. ASTM Spec. D-2241 (PVC plastic pipe SDR-PR and Class T)

3. Commercial Standard CS256-63 (pressure rated pipe)

4. National Sanitation Foundation Testing Laboratories (NFS)

5. Rubber Gasketing shall conform to ASTM 1869.

C. Pipe Dimensions

1. Standard lengths shall be 20 feet.

2. Wall thickness shall be in accordance with CS256-63 and ASTM d-2241.

3. Pipe ends shall be beveled to accept the gasketed coupling (4" and larger).

4. Minimum water main size is 8 inches.

D. Couplings and Fittings

1. The coupling and fittings shall be furnished by the pipe manufacturer and shall accommodate the pipe for which they are to be used.

2. They shall have a minimum pressure rating of 200 psi.

3. Insertion depth of the pipe in the coupling shall be controlled by a gauge mark or mechanical stop in the coupling which will allow for a thermal expansion and contraction.

E. Lubrication: Lubrication shall be water soluble, non-toxic, be non-objectionable in taste and odor imparted to the fluid, be non-supporting of bacteria growth, and have no deteriorating effect on the PVC or rubber gaskets.

F. Concrete Blocking

1. All fittings at bends and branches in water pipe lines shall be provided with concrete thrust blocking as shown on the Standard Drawings.

2. All bolts shall be greased and bends will be wrapped with 8 mil plastic.

3. Blocking shall be of concrete specified in Section 03300, poured in place and shall bear against solid undisturbed earth at the sides and bottom of the trench excavation and shall be shaped so as to not obstruct access to the joints of the pipe or fitting.

2.03 GATE VALVES

A. Gate valves may be used when application is 10" diameter or less.

B. Furnish gate valves that conform to the requirements of AWWA C-500, with cast iron body, bronze mounted, double disc, parallel seat, non-rising stem design with "O" ring seals.

C. Operating Direction: Open counterclockwise.

D. Buried Valves: Unless otherwise shown or specified, valves shall be of Mechanical Joint connection design for buried service.

E. Buried Valves shall have 2" operation nuts.

2.04 BUTTERFLY VALVES

A. Butterfly valves shall be used for application greater than or equal to 12" in diameter.

B. Material, in accordance with AWWA C-504.

C. Body Type

1. Valves shall be high strength cast iron ASTM A-126, Class B with 18-8 Type 304 stainless steel body seat.

2. Valve vane shall be mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel nylon locked screws.

3. Both valve ends shall be mechanical joint per AWWA Specification C-111 and accessories (bolts, glands, and gaskets) shall be included.

4. All butterfly valves shall be of the rubber-seated tight-closing type. The rubber seat shall be a full circle 360° seat not penetrated by the valve shaft.

D. Valve Shafts

1. The valve shaft shall be one piece extending full size through the entire valve and operator with no neckdown, keyways, or holes to weaken it.

2. The valve shaft shall have 304 stainless steel journals rotating in reinforced Teflon bearings.

3. Valves shall have permanently set two-way thrust bearing.

4. Packing shall be "triple-seal" rubber designed for permanent duty in underground service.

2.05 VALVE BOXES

A. All buried valves shall be installed complete with a cast iron, 2 piece, screw type, 5 1/4 inch shaft valve box.

2.06 TAPPING SADDLES

A. For tapping saddles used for service connections to plastic pipe, provide full circle saddles. For all other pipe provide double strap bronze alloy, ductile iron, or stainless steel saddles.

B. Provide tapping saddles that have a minimum rated working pressure of 300 psi, neoprene Buna N gaskets, and bronze tapered threads.

2.07 LATERAL SERVICE CONNECTIONS

A. Provide and install according to standard drawings

B. Service Pipe:

1. Provide single length (no splices) of PEP pipe (copper pipe size) with compression fittings.

2. Locate service taps in the upper quadrant of the main line, approximately at 45 degrees. The minimum distance between taps is 24", with a 5 degree stager. Do not make service taps within 24" of the end of the main line.

3. Service saddles are required on all taps unless indicated otherwise.

4. In subdivision developments, the contractor shall be responsible to furnish and install the corporation type stop and laterals to a point on private property 24 inches past the street right-of-way line.

C. Meter Boxes: Plastic or asphalt-dipped corrugated metal. Fiber meter boxes are not acceptable. Provide a meter box with ring and cover of sufficient strength to withstand loadings in vehicular traffic areas without breaking.

D. Coppersetters or metersetters shall be manufactued by Ford series 70.

E. All materials to be supplied by the Contractor, except for the meter.

2.08 HYDRANT

A. In accordance with AWWA C502.

B. 6-inch cast iron hydrant as manufactured by Watrous .

C. Cast-Iron Body Fire Hydrant: Compression type, opening against pressure and closing with pressure, base valve design, 150 psi working pressure, with 1/4" diameter minimum tapping and bronze plug in standpipe.

1. Size: Minimum 5" valve opening

2. Direction to Open Hydrant: Left

3. Size and Shape of Operating and Cap Nuts: Pentagon 1-1/2" point to flat.

4. Hose Nozzles: Two 2-1/2" National Standard Thread, cap, gasket and chain.

5. Pumper Nozzles: One 4-1/2" National Standard Thread, cap, gasket and chain.

6. Depth of Cover: 5'-0" unless indicated otherwise.

7. Connection to Main: O-ring seals and a 6" ASA 125 pound flanged inlet.

8. Pressure: Designed for a working pressure of 175 psi and a hydrostatic pressure of 350 psi.
9. Bottom connection: 6" flanged. Designed to allow the flanges at the sidewalk level to separate when hydrant is sheared off.

10. Automatic drain: Opens as the hydrant is closed.

D. Mechanical joint or flanged in accordance with AWWA C110 and AWWA C111.

E. Hydrant spacing shall not exceed 500-feet.

2.09 AIR RELEASE STATIONS

A. Air Releases shall be installed at all peaks and sharp changes in gradient as determined by the Engineer. If the waterline has service connections within the location of the peak or change in the gradient, the air release station may be eliminated at the Engineer's discretion.

PART 3 EXECUTION

3.01 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.02 BEDDING

A. Excavate pipe trench in accordance with Section 02225 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Form and place concrete for pipe thrust restraints at any change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide thrust restraint bearing on subsoil according to standard drawings.

C. Place bedding material at trench bottom, fill materials in one continuous layer not exceeding 8 inches compacted depth; compact to 95 percent.

D. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent.

E. Maintain optimum moisture content of bedding material to attain required compaction density.

3.03 INSTALLATION - PIPE

A. The bottom of the trench shall be cut flat, true and even to provide uniform bearing for the full length of the pipe barrel.

B. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with adjoining pipe to prevent sudden offsets.

C. Pipe bedding and trench backfill shall be as defined in the previous sections.

D. As work progresses, interior of pipe shall be cleared of dirt and other superfluous materials.

E. Trenches shall be kept free from water until pipe jointing has been completed. Pipe shall not be laid when condition or trench or weather is unsuitable for such work.

F. At all times when work is not in progress, all open ends of pipe and fittings shall be securely closed so that no water, earth, or other substance will enter pipe or fittings.

G. Maintain separation of water main and services from sewer piping in accordance with Utah State Plumbing Code.

H. Install pipe to indicated elevation to within tolerance of 5/8 inches.

I. Install ductile iron piping and fittings to AWWA C600.

J. Route pipe in straight line.

K. Install pipe to allow for expansion and contraction without stressing pipe or joints.

L. Install access fittings to permit disinfection of water system performed under Section 02675.

M. Slope irrigation water pipe and position drains at low points.

N. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.

O. Establish elevations of buried culinary piping to ensure not less than 5 feet of cover.

P. Establish elevations of buried irrigation piping to ensure not less than 2 feet of cover.

Q. Install metallic tape continuous over top of pipe buried 12 inches above pipe line.

R. Backfill trench in accordance with Section 02250.

S. Handling Ductile Iron Pipe

1. Pipe and fittings shall be handled in such a manner as to insure installations in sound, undamaged condition.

2. Particular care shall be taken not to injure the pipe coating and lining. Cement lining in pipe or fittings which is broken or loosened shall be cause for rejection of the pipe or fittings.

3. All damaged pipe coating shall be repaired, prior to laying the pipe or placing the backfill.

4. Repair shall be accomplished by removing all damaged coating, wire-brushing to exposed metal, and applying two coats of coal tar coating of a type and quality to that originally in coating the pipe.

T. Cutting, Cleaning and Inspection

1. Cutting of pipe for closure pieces or for other reasons shall be done in a neat and workmanlike manner by a method which will not damage the pipe.

2. Before installation, each pipe shall be inspected for defects.

3. All defective, damaged or unsound pipe shall be rejected.

U. Location of Stub Pipes

1. The location of each stub shall be marked by placing a 2 x 4 marker at the end of the pipe and extending vertically from the end of the pipe to approximately 15 inches above the ground surface.

2. The portion of the 2 x 4 extending above ground, shall be painted as follows:

a. Red - indicating sewer stub.

b. Blue - indicating water

3. The sidewalk and curb shall be stamped in the following manner, showing locations of water, sewer, and pressure irrigation stub pipes:

a. A “W” stamp for water.

b. A “S” stamp for sewer.

c. A “I” stamp for pressure irrigation

3.04 INSTALLATION - VALVES AND HYDRANTS

A. Set valves on solid bearing.

B. Locate valves on property lines, at each intersection, and not more than 500 feet between.

C. Center and plumb valve box over valve. Set box cover flush with finished grade with concrete collar as per standard drawings.

D. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

E. Paint hydrants Red

F. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.

3.05 INSTALLATION - SERVICE CONNECTIONS

A. The contractor or home owner must provide and install all parts according to the standard drawings.

B. The Engineer or Public Works Department must inspect the installation before burying or backfilling. The Contractor shall conform to the following requirements before a water meter shall be installed.

1. Notify the Water Department at least five working days prior to the time the meter is to be installed and before backfilling.

2. The water lateral should be exposed in the street right-of-way one foot outside the property line, even if the lateral extends onto the property.

3. The end of the house lateral should be within 2 feet of the service lateral.

4. Both laterals should be exposed freely in the center of the excavation.

5. To prevent damage from possible freezing, the water lateral may be covered with materials such as sand, light gravel, straw, insulation, or similar light materials.

6. To establish the correct street right-of-way line, the property line pins must be in place or the sidewalk.

C. All of the above requirements must be complied with to the satisfaction of the Engineer before the water meter will be installed.

D. A service charge will be assessed for crew time when the prerequisites are not met before the scheduled item for setting a meter. This fee must be paid before the meter installation will be rescheduled.

E. Place meter can in park strip or 1 foot behind sidewalk.

F. Install setter no closer than 24" of ground surface.

G. Lids shall be flush with top of sidewalk elevation.

3.06 DISINFECTION OF CULINARY WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 02675.

3.07 TESTING OF WATER PIPING SYSTEMS

A. Test pipeline system in accordance with Section 02660.

3.08 TRACER WIRE INSTALLATION

A. Copper tracer wire to be installed the total length of pipeline with a branch to each tee, cross, and fire hydrant. Copper tracer wire should be run to each lateral as shown in the Standard (See Detail).

1. Copper wire should be #14 gauge single strand jacketed wire, manufactured for underground service.

2. Wire shall be continuous without breaks. Splices shall be made with petroleum filled wire nut caps.

3. Tracer Wire to be secured to top of pipe at a minimum of every Ten feet, by means other than metallic.

4. Tracer Wire should be brought up in all fire hydrants in culinary water lines, and in the first lateral of each street for pressurized irrigation (not to exceed 500 feet).

B. A continuity test shall be performed by the contractor in the presence of the engineer prior to paving.

3.09 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with section 02250.

B. If tests indicate Work does not meet specified requirements, remove work, replace, and retest.

END OF SECTION

SECTION 02675

DISINFECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Disinfection of potable water system.

B. Test and report results.

1.02 REFERENCES

A. AWWA A100: AWWA Standard for Water Wells.

B. AWWA B300: AWWA Standard for Hypochlorites.

C. AWWA B301: AWWA Standard for Liquid Chlorine.

D. AWWA C651: AWWA Standard for Disinfecting Water Mains.

E. AWWA C652: AWWA Standard for Disinfection of Water-Storage Facilities.

F. State of Utah: Public Drinking Water Regulations, Part 2, Section 12.

1.03 DEFINITIONS

A. Disinfectant Residual: The quantity of disinfectant in treated water.

B. ppm: Parts per million.

1.04 SUBMITTALS

A. Contractor's evidence of experience in disinfection.

B. Bacteriological laboratory's evidence of certification.

C. Disinfection Report: 3 copies including:

1. Date issued.
2. Project name and location.
3. Treatment contractor's name, address and phone number.
4. Type and form of disinfectant used.
5. Time and date of disinfectant injection started.
6. Time and date of disinfectant injection completed.
7. Test locations.

8. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.

9. Time and date of flushing start.

10. Time and date of flushing completion.

11. Disinfectant residual after flushing in ppm for each outlet tested.

D. Bacteriological Report: 3 copies including:

1. Date issued.

2. Project name and location.

3. Laboratory's name, certification number, address, and phone number.

4. Time and date of water sample collection.

5. Name of person collecting samples.

6. Test locations.

7. Time and date of laboratory test start.

8. Coliform bacteria test results for each outlet tested.

9. Certification that water conforms or fails to conform to bacterial standards of State of Utah public drinking water regulations.

10. Bacteriologist's signature.

1.05 QUALITY ASSURANCE

A. Affidavit by manufacturer that disinfectant conform to AWWA standards.

B. Bacteriological Laboratory: Certified by State of Utah.

1.06 PRODUCT HANDLING

A. Store and protect disinfectant in accordance with manufacturer's recommendations to protect against damage or contamination. Do not use unsuitable disinfectant.

B. Follow all instruction labeling for safe handling and storage of disinfectant materials.

1.07 REGULATORY REQUIREMENTS

A. Conform to State of Utah public drinking water regulations.

PART 2 PRODUCTS

2.01 DISINFECTANT

A. Liquid Chlorine: AWWA B301 with chlorine 99.5 percent pure by volume.

B. Sodium Hypochlorite: AWWA B300 with not less than 100 grams per liter available chlorine.

C. Calcium Hypochlorite: AWWA B300 with 65 to 70 percent available chlorine by weight in granular form.

D. Powder, tablet, or gas according to manufacturer's specification.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to starting the disinfection procedure ensure the potable water system is completed, cleaned, tested in accordance with Section 02660 and ready for disinfection.

B. Ensure that the pipeline to be disinfected is not connected to the existing system.

3.02 DISINFECTION OF WATER LINES

A. Use on of the approved methods in AWWA C651.

B. Chlorination shall provide a minimum of 25 ppm residual after 24-hours contact in the pipeline. In general, this residual may be expected with an application of 50 ppm although some conditions may require more.

C. Chlorine, in the form of a 1% slurry of high test calcium hypochlorite (HTH, Perchloron, Pittchlor, etc.) shall be fed into the pipeline in such a manner as to mix with the water flowing in the pipeline. (A 1% slurry results from mixing 1 pound of the calcium hypochlorite with 7.50 gallons of water.)

D. The following table provides information as to the required quantity of slurry to be used per 100 feet of pipe to provide a chlorine concentration of 50 ppm:

Pipe Size (In.)	Vol. Of 100 Ft. Length (gal.)	Required Amount of Slurry (gal.)
4	65	0.33
6	147	0.74
8	261	1.3
10	408	2.0
12	588	3.0
16	1044	5.2

E. During the process of chlorinating the pipeline all valves and other pipeline appurtenances shall be operated several times to provide sufficient contact with the chlorinating agent.

3.03 DISINFECTION OF CULINARY WELLS

A. Use one method defined under AWWA A100 as approved by Engineer.

B. Do not start disinfection until well is thoroughly cleaned.

C. Use a disinfecting solution containing a minimum of 50 ppm residual chlorine.

3.04 DISINFECTION OF WATER STORAGE RESERVOIRS

A. Use one method defined under AWWA C652, as approved by Engineer.

B. Do not start disinfection until water storage tank is thoroughly cleaned.

C. Provide and use necessary safety equipment for workers in contact with disinfectant or gasses they may produce.

3.05 QUALITY CONTROL - BACTERIOLOGICAL TEST

A. No samples for testing shall be taken sooner than 24 hours after system flushing.

B. Sample water at each of the following locations, as applicable:

1. Where water enters system.
2. Ends of piping runs.
3. Remote outlets.

C. Analyze water samples in accordance with State of Utah requirements.

D. If bacteriological test proves water quality to be unacceptable, repeat system treatment.

E. Water systems shall not be accepted or placed into service until a negative bacteriological test is made on water taken. Repeat dosing as necessary until a negative test is obtained. Provide a copy of the negative bacteriological test to Engineer.

F. It shall be the developer's responsibility to submit and pay for the bacteriological test.

3.06 FLUSHING AND DISPOSAL OF DISINFECTANT

A. After the 24 hour retention period, flush the chlorinated water from the main until chlorine measurements show the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.

B. Legally dispose of disinfecting water and ensure no chlorine buildup or damage to the environment.

C. Failing to flush the line may require Contractor to replace all gaskets and valves within the system at Contractor's expense.

END OF SECTION

WELL MAINTENANCE SPECIFICATIONS

INSPECT WELL USING DOWNHOLE VIDEO CAMERA (OPTIONAL)

If directed by the ENGINEER, the CONTRACTOR shall use a downhole video camera to inspect the casing and perforated interval of the well. The video camera shall have both downward and side viewing capability, and the video log shall be made in color, shall record the depth of the camera at all times during logging, and shall clearly show the interior condition of the well to the satisfaction of the ENGINEER. CONTRACTOR shall provide one copy of the completed video log to the ENGINEER on either standard VHS tape or DVD (preferred).

BRUSH, BAIL AND RE-DEVELOP THE WELL (OPTIONAL)

If directed by the ENGINEER, the CONTRACTOR shall clean and redevelop the well using mechanical methods, followed by re-development. The CONTRACTOR shall use brushes, bailer, close-fitting surge blocks and other tools to mechanically remove scale from casing and well screen. The equipment and techniques shall be compatible with the PVC well casing and stainless steel well screen, taking care to not damage the well.

All debris and sediment shall be removed and the borehole cleaned to the original depth of 209 feet. Well development should include surging and bailing for which the CONTRACTOR shall be prepared by providing a reasonably close-fitting surge block and a bailer with sufficient line to reach the total depth of the well. A dispersing agent may be utilized to break down clay in the borehole if approved by the ENGINEER. Well development shall conform to the requirements of UAC R309-515-6(7), *Well Development*.

The CONTRACTOR shall be responsible for storage, use, and disposal of the chemicals or water containing the chemicals in accordance with applicable local, state, and federal regulations. Sediment, cuttings, and scale removed from the well shall be contained and transported off site for proper disposal.

Discharge of clean water produced during mechanical cleaning, redevelopment and pumping will be allowed; however, no adverse impacts to nearby surface water bodies will be allowed. Water produced during mechanical cleaning, redevelopment and testing shall be discharged into a holding tank or series of tanks. Overflow from the tanks shall pass through straw bails and/or geofabric for erosion control and further filtration. The CONTRACTOR shall provide, at his own expense, any tanks, hay bales, geofabric, riprap, flexible hose, PVC tubing, and other materials and equipment to divert and dissipate the energy of and minimize erosion from the discharged water, filter and allow for settling of the solids in the discharged water, and comply with this requirement. Control of produced water shall conform to Utah Water Quality Act, 19-5-107(1).

WELL DISINFECTION (REQUIRED)

Following re-development and installation of the well pump, the well shall be disinfected using a solution of high-test calcium hypochlorite or sodium hypochlorite sufficient to establish a concentration of 100 parts per million (ppm) chlorine residual throughout the well bore. After adding the disinfectant to the well, the pump in the well should be used to recirculate the water such that the pumped water is returned to the well and allowed to wet the portion of the casing above the water level in the well. After recirculation of the chlorinated well water, the CONTRACTOR shall allow 12 hours of contact time before pumping the chlorinated water from the well. Well disinfection procedures shall be disinfected according to AWWA Standard C654 published by the American Water Works Association and conform to UAC R309-515-6(11), *Well Disinfection* and UAC R655-4-9.6.5, *Chlorination of Water*.

WLI

WELL DRILLER'S REPORT

RECEIVED APR 08 1998 WATER RIGHTS SALT LAKE

State of Utah
Division of Water Rights

For additional space, use "Additional Well Data Form" and attach

Well Identification
CHANGE APPLICATION: a21990(55-9286)

Owner *Note any changes*

USA Bureau of Reclamation
302 East 1860 South
Provo, UT 84606-7317

Contact Person/Engineer: ____________

Well Location *Note any changes*

COUNTY: Wasatch
NORTH 190 feet WEST feet from the SE Corner of
SECTION 33, TOWNSHIP 4S, RANGE 4E, SLB&M.

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #) ~~Deer Creek Res.~~

Drillers Activity Start Date: March 11, 1998 Completion Date: April 2, 1998

Check all that apply:
☒ New ☐ Repair ☐ Deepen ☐ Abandon ☐ Replace ☐ Public Nature of Use:

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0.0	209.0	11-inch	Air Rotary - Odex	Air

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on *water quality* if known.)
0.0	10				x	x	x	x x	x				brown	
10	20					x	x	x	x				brown	
20	30					x	x	x	x				brown	
30	40					x	x	x	x				brown	
40	50					x	x	x	x				brown	
50	60					x	x	x					brown	
60	70					x	x	x					brown	
70	80					x	x	x					brown	
80	90					x	x	x					brown	
90	100					x	x	x					brown	

SCANNED

Static Water Level

Date 3/31/98 Water Level 119.6 feet Flowing? ☐ Yes ☒ No

Method of Water Level Measurement Water Level meter If Flowing, Capped Pressure ______ PSI

Point to Which Water Level Measurement was Referenced ground level

Height of Water Level reference point above ground surface 0 feet Temperature 10 ☒ °C ☐ °F

BKP

ADDITIONAL WELL DATA FORM

Water Right # a21990(55-9286)

OWNER NAME USA Bureau of Reclamation

Page____of____

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE high	PERMEABLE low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTIONS AND REMARKS (include comments on water quality if known.)
100	110					x	x	x					brown	damp to dry cuttings
110	120					x	x	x					brown	dry cuttings
120	130	x		x		x	x	x					brown	moist cuttings
130	140	x		x		x	x	x					brown	"
140	150	x		x		x	x	x					brown	wet cuttings
150	160	x		x		x	x	x					brown	satuated cuttings
160	170	x		x		x	x	x					brown	"
170	180	x		x		x	x	x					brown	"
180	190	x		x	x	x	x	x					brown	"
190	200	x		x		x	x	x					brown	"
200	209	x		x		x	x	x					brown	"

SCANNED

Construction Information

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM (in)	DEPTH (feet) FROM	TO	SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
0.0	20 ft	steel	0.25	6"	189	209	0.10	6"	stainless steel
20	189	PVC - Sched 80		6"					

CASING; SCREEN ☒ PERFORATIONS ☐

Well Head Configuration: 18" Steel stand pipe 6" Access Port Provided? ☐ Yes ☐ No

Casing Joint Type: threaded Perforator Used:

FILTER PACK / GROUT / PACKER / ABANDONMENT MATERIAL

DEPTH (feet) FROM	TO	ANNULAR MATERIAL, ABANDONMENT MATERIAL and/or PACKER DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0.0	127.5	Portland cement	72 961b sacks	15 lbs/gal.
127.5	139.4	Bentonite pellets 3/8"	11 501b buckets	
139.4	179.0	8-12 silica sand	170 501b sacks	
179.0	209.0	16-40 silica sand	30 501b sacks	

Well Development / Pump or Bail Tests

Date	Method	Yield	Units Check One GPM	CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
3/28/98	Developed well using Air Jetting					
4/1 -4/2/98	pumpout test	9	x		51.6 ft	24 hrs

Pump (Permanent)

Pump Description: Horsepower: Pump Intake Depth: feet

Approximate maximum pumping rate: Well disinfected upon completion? ☐ Yes ☐ No

Comments

Description of construction activity, additional materials used, problems encountered, extraordinary circumstances, abandonment / procedures. *Use additional well data form for more space.*

Bedrock not encountered in this hole suggesting a buried channel.

SCANNED

Well Driller Statement

This well was drilled or abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name US Bureau of Reclamation - Ira Terry License No. 681

(Person, Firm, or Corporation – Print or Type)

Signature Ira Terry Date 4/6/98

(Licensed Well Driller)

Construction Information (con't)

DEPTH (feet)		CASING			DEPTH (feet)		SCREEN ☐ PERFORATIONS ☐		
FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)	FROM	TO	SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)

DEPTH (feet)		FILTER PACK / GROUT / PACKER / ABANDONMENT MATERIAL		
FROM	TO	ANNULAR MATERIAL, ABANDONMENT MATERIAL and/or PACKER DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)

Comments (con't)

SCANNED

Well Driller Statement This well was drilled or abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name U S Bureau of Reclamation - Ira Terry License No. 681
(Person, Firm, or Corporation – Print or Type)

Signature [signature]
(Licensed Driller)

Date 4/6/98