



STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

May 24, 2007

TEST WELL CENTRAL UTAH CORRECTIONAL FACILITY

DEPARTMENT OF CORRECTIONS GUNNISON, UTAH

DFCM Project Number 05025110

Willowstick Technologies
11814 Election Road, Suite 100
Draper, Utah 84020

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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> or are available upon request from DFCM.

DFCM General Conditions dated May 25, 2005.

DFCM Application and Certification for Payment dated May 25, 2005.

Technical Specifications :

Drawings:

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>

NOTICE TO CONTRACTORS

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

TEST WELL – CENTRAL UTAH CORRECTIONAL FACILITY
DEPARTMENT OF CORRECTIONS – GUNNISON, UTAH
DFCM PROJECT NO: 05025110

Bids will be in accordance with the Contract Documents that will be available at 9:00 AM on Thursday, May 24, 2007, and distributed in electronic format only on CDs from DFCM at the Wasatch Building at the Utah State Fairpark, approximately 155 North 1000 West, Salt Lake City, Utah and on the DFCM web page at <http://dfcm.utah.gov>. For questions regarding this project, please contact Lynn Hinrichs, DFCM, at 801-538-3018. No others are to be contacted regarding this bidding process. The base bid construction budget for this project is \$140,800.

Bids will be received until the hour of 2:00 PM on Wednesday, June 6, 2007 at the Wasatch Building at the Utah State Fairpark, approximately 155 North 1000 West, Salt Lake City, Utah. Refer to the map on the DFCM website for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf). Bids will be opened and read aloud in the Wasatch Building at the Utah State Fairpark. NOTE: Bids must be received at the Wasatch Building at the Utah State Fairpark 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
Marla Workman, Contract Coordinator
4110 State Office Building, Salt Lake City, Utah 84114

PROJECT DESCRIPTION

This project includes the drilling of a test well on State Institutional Trust Lands north of Gunnison, Utah. Testing of the production rate and quality of the water shall be conducted directly following the completion of the test well. In the event that the #1 test well is unsatisfactory, the owner may decide to retain the services of the contractor to drill the #2 test well location as identified in the project drawings.

Two bid schedules have been attached. Please use the appropriate form for the type of drilling method you would propose, fill out and attach to your official DFCM Bid Form. Please refer to the project specifications and drawings, available from the DFCM website at <http://dfcm.utah.gov>

**PROJECT SCHEDULE**

PROJECT NAME:		TEST WELL – CENTRAL UTAH CORRECTIONAL FACILITY DEPARTMENT OF CORRECTIONS – GUNNISON, UTAH		
DFCM PROJECT NO.		05025110		
Event	Day	Date	Time	Place
Bidding Documents Available	Thursday	May 24, 2007	9:00 AM	Wasatch Building Utah State Fairpark Approx 155 North 1000 West Salt Lake City, UT or DFCM web site *
Last Day to Submit Questions	Thursday	May 31, 2007	4:00 PM	Lynn Hinrichs - DFCM E-mail lynnhinrichs@utah.gov Fax to 801-538-3267
Prime Contractors Turn In Bid and Bid Bond	Wednesday	June 6, 2007	2:00 PM	Wasatch Building Utah State Fairpark Approx 155 North 1000 West Salt Lake City, UT **
Sub-contractor List Due	Thursday	June 7, 2007	2:00 PM	DFCM 4110 State Office Bldg SLC, UT Fax 801-538-3677
Substantial Completion Date	Wednesday	August 15, 2007		

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

** **Due to the ongoing construction on Capitol Hill and the anticipated shortage of parking during 2007, all bids will be received and opened at the Wasatch Building at the Utah State Fairpark. Refer to map on the DFCM web site for directions (http://dfcm.utah.gov/downloads/fairpark_map.pdf)**



Division of Facilities Construction and Management

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 TEST WELL - CENTRAL UTAH CORRECTIONAL FACILITY - DEPARTMENT OF CORRECTIONS - GUNNISON, UTAH DFCM PROJECT NO. 05025110 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: _____

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 NO. 1: For all work shown on the Drawings and described in the Specifications and Contract Documents to drill #2 test well, I/we agree to perform for the sum of:

_____ DOLLARS (\$) _____
(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work for the base bid will be Substantially Complete by August 15, 2007, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of \$50.00 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 100% 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.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. **THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.**

If the bid bond security is submitted on a bid bond form other than DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. **NOTE: A cashier's check cannot be used as a substitute for a 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. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

11. Time is of the Essence

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

12. 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.

13. 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.

14. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

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

15. Debarment

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. 1953, 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

**Division of Facilities Construction and****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, on the following basis:

PROJECTS UNDER \$500,000 - ALL SUBS \$20,000 OR OVER MUST BE LISTED
PROJECTS \$500,000 OR MORE - ALL 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.
- Bidder must list "Self" if performing work itself.

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.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'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.

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM
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GROUND 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	CONT. 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)

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



Division of Facilities Construction and

SUBCONTRACTORS LIST
FAX TO 801-538-3677

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

Table with 4 columns: 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 DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. 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 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%

CONTRACTOR'S AGREEMENT
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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.

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. 1953, 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, 1953, 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: _____ (Seal)
Attorney-in-Fact

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.

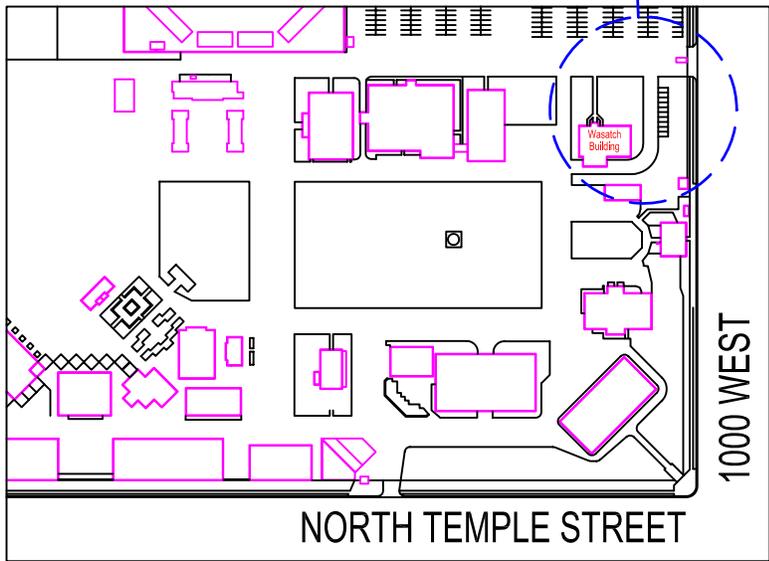
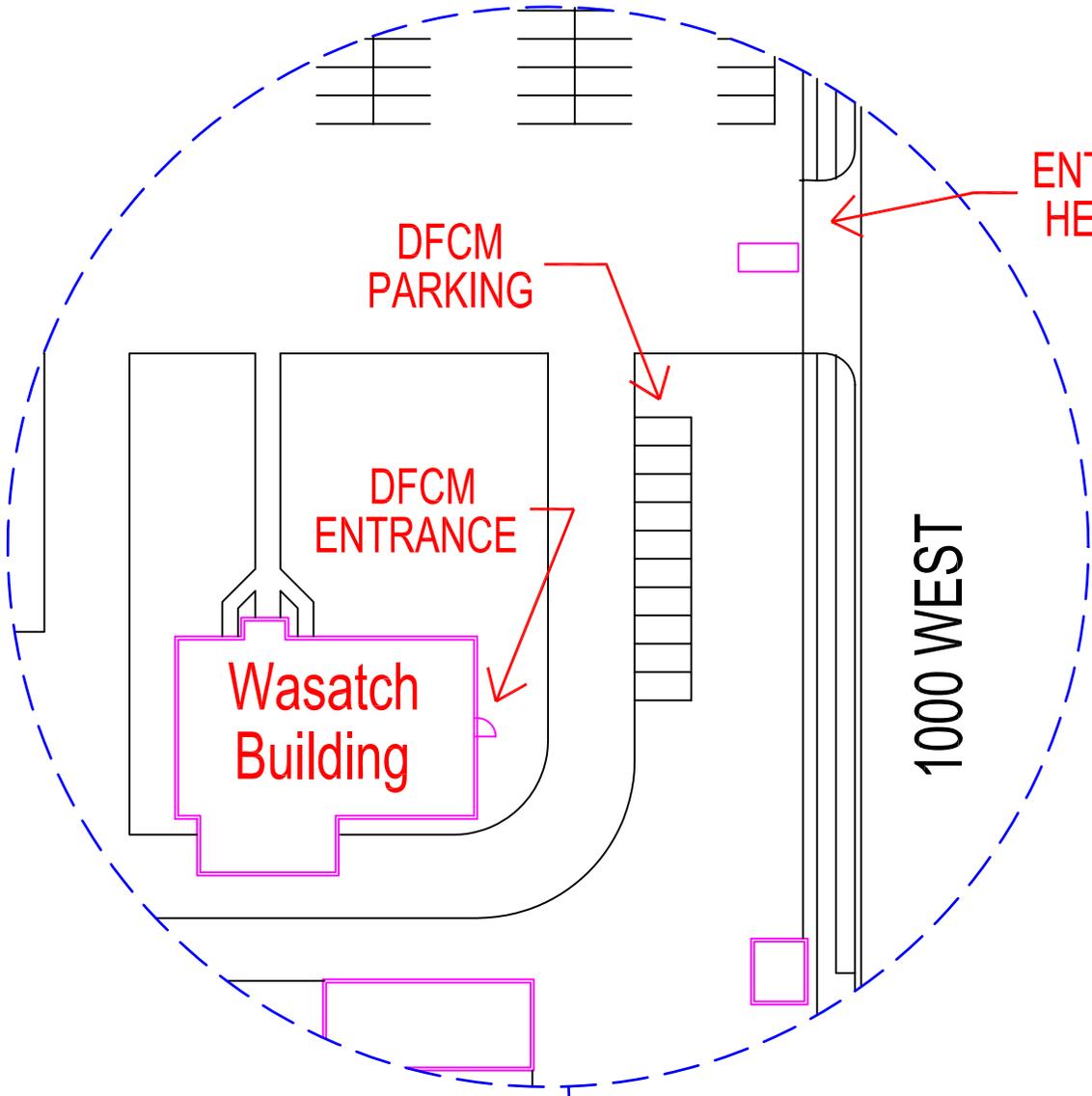
The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: \$_____. If the list of items is 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.

CONTRACTOR (include name of firm) by: _____ (Signature) DATE

A/E (include name of firm) by: _____ (Signature) DATE

USING INSTITUTION OR AGENCY by: _____ (Signature) DATE

DFCM (Owner) by: _____ (Signature) DATE



UTAH STATE
FAIR PARK



DFCM Temporary Location

Schedule 1: One Test Well – Cable Tool Drilling Method

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

*Note: 1. Bids shall include sales tax and all other applicable taxes and fees
 2. All bids shall be checked for errors. If errors are made, unit prices shall govern and corrections will be made according to the unit price and totals will be revised to reflect the corrections.*

No.	Meas. & Pmt. Reference	Item	Quantity	Unit	Unit Price	Amount
1	02000	Mobilization	1	LS		
2	SP13100	18" Conductor Casing Furnishing and Installing	100	LF		
3	SP13110	10" Diameter Hole Drilling and Well Log Preparing	500	LF		
4	SP13110	10" Diameter Casing Furnishing and Installation	600	LF		
5	SP13110	10" Casing Perforation	300	LF		
6	SP13110	Furnish, Install and Remove Test Pump (500' deep)	500	LF		
7	SP13110	Well Development	8	HR		
8	SP13110	Test Pumping (Target Capacity 1000 gpm)	32	HR		
9	SP13110	Conductor Casing Removal or Perforation	100	LF		
10	SP13110	Surface Seal Material and Installation	100	LF		
11	SP13110	Well Abandonment (Cap and Seal)	1	LS		
12	SP13110	Well Log Preparation	1	LS		

**TOTAL BID FOR
 ONE WELL**
**TOTAL BID FOR
 WELLS #1 & #2**
**DAYS REQUIRED TO
 COMPLETE ONE WELL**
**DAYS REQUIRED TO
 COMPLETE WELLS #1 & #2**

The undersigned Bidder certifies that this proposal is made in good faith, without collusion or connection with any other person or persons bidding on the work.
 Seal (if bid is by Corporation)

Respectfully Submitted:

Bidder: _____

Signature _____

Title: _____

License No. _____

Address: _____

Date: _____

Schedule 1A: One Test Well – Rotary Drilling Method

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

*Note: 1. Bids shall include sales tax and all other applicable taxes and fees
2. All bids shall be checked for errors. If errors are made, unit prices shall govern and corrections will be made according to the unit price and totals will be revised to reflect the corrections.*

No.	Meas. & Pmt. Reference	Item	Quantity	Unit	Unit Price	Amount
1	02000	Mobilization	1	LS		
2	SP13110	22" Conductor Casing Furnishing and Installing	50	LF		
3	SP13110	14" Diameter Hole Drilling and Well Log Preparing	550	LF		
4	SP13110	Geophysical Logging	1	LS		
5	SP13110	10" Diameter Casing Furnishing and Installation	300	LF		
6	SP13110	10" Screen	300	LF		
7	SP13110	Tremie Pipe	300	LF		
8	SP13110	Gravel Pack Material and Placement	10	CUYD		
9	SP13110	Development Pumping (Rig Rate)	8	HR		
10	SP13110	Furnish, Install and Remove Test Pump (500' deep)	500	LF		
11	SP13110	Test Pumping (Target Capacity 1000 gpm)	32	HR		
12	SP13110	Conductor casing removal or perforation	50	LF		
13	SP13110	Surface Seal Material and Installation	100	LF		
14	SP13110	Well Abandonment (Cap and Seal)	1	LS		
15	SP13110	Well Log Preparation	1	LS		

**TOTAL BID FOR
ONE WELL**

**TOTAL BID FOR
WELLS #1 & #2**

**DAYS REQUIRED TO
COMPLETE ONE WELL**

**DAYS REQUIRED TO
COMPLETE WELLS #1 & #2**

The undersigned Bidder certifies that this proposal is made in good faith, without collusion or connection with any other person or persons bidding on the work.
Seal (if bid is by Corporation)

Respectfully Submitted:

Bidder: _____

Signature _____

Title: _____

License No. _____

Address: _____

Date: _____

01019.2.6 MEASUREMENT BY LUMP SUM

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

01019.2.7 MEASUREMENT BY LINEAL FOOT

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

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

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

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

01019.2.8 MEASUREMENT BY AREA

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

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

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

01019.2.9 MEASUREMENT BY VOLUME

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

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

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

01019.2.10 MEASUREMENT BY WEIGHT

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

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

Cement will be measured by the ton or hundredweight.

01019.2.11 CONVERSION OF WEIGHT TO VOLUME

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

01019.2.12 SPECIFIC MANUFACTURED ITEMS

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

01019.2.13 RENTAL EQUIPMENT

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

01019.2.14 MEASUREMENT BY EACH

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

01019.3 PAYMENT**01019.3.1 SCOPE OF PAYMENT**

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

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

01019.3.2 NON-PAYMENT

No payment will be made for:

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

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

01019 3 3 LUMP SUM

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

01019 3 4 FULL PAYMENT

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

01019.3 5 VARIATION IN QUANTITY OF WORK

When the final and accepted quantity of an item of work varies from the original quantity in the Bid Schedule but is within twenty-five (25) percent of that quantity, whether more or less, the Contractor shall accept payment at the unit price shown on the Bid Schedule for the actual quantity of work performed, which shall constitute payment in full for that item. If the variation in the quantity of an item of work shown on the Bid Schedule exceeds twenty-five (25) percent of the original quantity, whether more or less, an adjustment of unit price may be negotiated. Any adjustment resulting from such negotiation shall be authorized by Change Order in accordance with the General Conditions.

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

01030.1 DESCRIPTION

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

01030.2 PRE-CONSTRUCTION CONFERENCE

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

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

01030 2.1 Unless previously submitted to the Engineer, the Contractor shall bring to the conference one copy each of the following:

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

01030 2.2 The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda may include but not be limited to the following items:

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

01030 2.3 The Engineer will preside at the pre-construction conference and will arrange for keeping minutes and distributing them to all attendees to the meeting.

01030.3 PROGRESS/COORDINATION MEETINGS

01030 3.1 The Contractor shall conduct regular on-site progress and coordination meetings at least weekly and at other times as requested by Engineer or as required by progress of the work. The

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

01030 3.2 The Contractor shall preside at the meetings and maintain a file of minutes of the proceedings. The purpose of the meetings will be to review the progress of the work, maintain coordination of effort, discuss changes in scheduling, and resolve other problems which may develop.

01090.1 DESCRIPTION

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

01090.1.1 DEFINITIONS OF ABBREVIATIONS AND ACRONYMS

AAR	Association of American Railroads
AASHTO	American Association of the State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute, Inc.
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society of Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BLM	Bureau of Land Management (U S Department of Interior)
CEMA	Conveyor Equipment Manufacturer's Association
CGA	Compressed Gas Association
CFR	Code of Federal Regulations
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
DIP	Ductile Iron Pipe
EIA	Electronic Industries Association
EPA	U. S. Environmental Protection Agency
ETL	Electrical Test Laboratories
FEMA	Federal Emergency Management Administration
FERC	Federal Energy Regulatory Commission
FS	Forest Service (U S Department of Agriculture)
FWS	Fish and Wildlife Service
GI	Galvanized Iron
ICBO	International Conference of Building Officials
ID	Inside Diameter
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IME	Institute of Makers of Explosives
ISA	Instrument Society of America
ISO	International Organization for Standardization
MBMA	Metal Building Manufacturer's Association
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards

NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NRCS	Natural Resources Conservation Service (U.S. Department of Agriculture) (formerly SCS)
OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PE	Polyethylene
PVC	Polyvinyl Chloride
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SSPWC	Standard Specification for Public Works Construction
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc
UPRR	Union Pacific Railroad
USDARD	Rural Development (U.S. Department of Agriculture) (formerly Farmers Home Administration)
WCRSI	Western Concrete Reinforcing Steel Institute
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

01090.2 REFERENCED WORKS, CODES AND STANDARDS

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

01090.2.1 TITLES OF SECTIONS AND PARAGRAPHS

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

01090.2.2 APPLICABLE PUBLICATIONS

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

01090.2.3 SPECIALISTS AND SPECIAL ASSIGNMENTS

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

01090.2.4 BUILDING CODES

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

01090.2.5 OSHA

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

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

01090.2.6 DOT STANDARDS/SPECIFICATIONS

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

01090.2.7 FEDERAL PIPELINE SAFETY STANDARDS

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

01090.2.8 STATE GAS PIPELINE SAFETY STANDARDS

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

01090.3 STANDARDS IMPOSED BY OTHER AGENCIES OR ORGANIZATIONS

01090.3.1 PROPERTY BELONGING TO OTHER AGENCIES OR ORGANIZATIONS

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

01090.3.2 ADDITIONAL INFORMATION AND SPECIFICATIONS

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

01090.4 CONFLICTS

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

01200.1 DESCRIPTION

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

01200.1.1 RELATED WORK AND REFERENCED SECTIONS

Not used.

01200.1.2 SUBMITTALS

Section 01300 - Submittals
See paragraph 01200.3.5 below.

01200.1.3 DEFINITIONS

Not used.

01200.2 MATERIALS

Not used.

01200.3 CONSTRUCTION REQUIREMENTS**01200.3.1 CLEANUP**

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

01200.3.2 REPAIR AND RESTORATION

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

01200.3.3 TESTING

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

01200.3.4 ACCEPTANCE FROM PROPERTY OWNER

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

01200.3.5 SUBMITTAL OF MANUFACTURER'S DOCUMENTATION

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

01200.3.6 FINAL ACCEPTANCE

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

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

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

01200.4 METHOD OF MEASUREMENT

Not used.

01200.5 BASIS OF PAYMENT

Not used

01300.1 DESCRIPTION

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

01300.2 SHOP DRAWINGS AND MATERIALS SUBMITTALS**01300.2.1 NUMBER OF COPIES OF SUBMITTALS**

The Contractor shall furnish six (6) copies of each shop drawing and pertinent materials information sheet to the Engineer for review. Following review and approval, two copies shall be returned to the Contractor for his records, two shall be retained by the Engineer for inspection and verification purposes, and two shall go to the Owner as working and archival records.

01300.2.2 SHOP DRAWINGS

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

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

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

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

Fabrication work shall not commence until the Engineer has reviewed the pertinent shop drawing/s and returned copies to the Contractor marked either "Approved" or "Approved - Except as Noted".

Corrections indicated on such submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis of claims for extra work

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

001300.2.3 MATERIALS INFORMATION SUBMITTALS

In keeping with 01300.2.1 above, the Contractor shall assemble and submit six (6) original copies of each manufacturer's catalog cuts and materials information sheets pertaining to materials and

equipment to be furnished and installed in the Work. Photocopies of the catalog cuts and information sheets will not be acceptable as submittals without prior authorization from Engineer.

01300.2.4 CONTRACTOR LIABILITY

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

01300.3 SAMPLES

01300.3.1 NUMBER OF SUBMITTALS

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

01300.3.2 TIMELY AND ORDERLY SUBMITTAL

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

01300.3.3 SELECTION OF COLORS AND TEXTURES

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

01300.4 OPERATIONS AND MAINTENANCE MANUALS

01300.4.1 STRUCTURE OF OPERATIONS AND MAINTENANCE MANUALS

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

01300.4.2 CONTENTS

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

- Care and maintenance of all finished exposed surfaces.
- Complete operating instructions, including location of controls, special tools or other equipment required, related instrumentation, and other equipment needed for operation.
- Preventive maintenance procedures and schedules.

- Complete parts lists, by generic title, identification number, and catalog number, complete, with exploded views of each assembly.
- Disassembly and reassembly instructions
- Name and location of nearest supplier and spare parts warehouse
- Name and location of manufacturer.
- Recommended start-up, testing and troubleshooting procedures
- Prints of the record drawings, including diagrams and schematics, as required under the electrical and instrumentation portions of these specifications.

01300.4.3 SCHEDULE OF DELIVERY

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

01300.5 SCHEDULE OF VALUES

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

01300.6 CONTRACT CONSTRUCTION SCHEDULE

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

01300.7 PROCUREMENT SCHEDULE

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

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

01300.8 CONSTRUCTION PHOTOGRAPHY RECORDS

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

01400.1 DESCRIPTION

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

01400.2 ASSIGNMENT OF RESPONSIBILITY**01400.2.1 THE CONTRACTOR**

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

01400.2.2 THE OWNER AND ENGINEER

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

01400.2.3 CORRECTIONS

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

01400.3 QUALITY OF MATERIALS**01400.3.1 COMPLIANCE WITH SPECIFICATIONS**

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

01400.3.2 SPECIFIED MATERIALS

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

01400.3.3 SUBSTITUTION OF MATERIALS

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

01400.4 QUALITY OF WORK

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

01400.5 INSPECTION

01400.5.1 AUTHORITY AND DUTIES OF INSPECTOR

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

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

01400.5.2 INSPECTION OF MATERIALS

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

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

01400.5.3 CONTRACTOR LIABILITY

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

01500.1 DESCRIPTION

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

01500.2 REQUIREMENTS

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

- The Contractor shall employ sufficient labor and equipment with adequate training and capability for prosecuting the Work to full completion in the manner and time required by these Specifications.
- All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have appropriate training and sufficient experience in such work, in the opinion of the Engineer, to perform all work properly and satisfactorily.
- Any person employed by the Contractor or by any Subcontractor who, in the opinion of the Engineer, does not perform their work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed forthwith by the Contractor or Subcontractor employing such person. Such person/s shall not be employed again in any portion of the Work without the approval of the Engineer. When such action is considered, and if requested by that employee, a hearing attended by the employee, Engineer, and Contractor shall be conducted before final dismissal action is taken.
- Should the Contractor fail to remove such person or persons as required above or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work, the Engineer may suspend the Work by written notice until such order is complied with.
- All equipment, which is proposed to be used on the Work, shall be of sufficient size and in such mechanical condition, in the opinion of the Engineer, as to produce a satisfactory quality of Work. Equipment used on any portion of the Work shall be fitted with appropriate protective devices in accordance with OSHA and other applicable safety regulations such that no injury to employees, the Work, or to adjacent property will result from its use.
- When the specific methods and equipment to be used by the Contractor in accomplishing the Work are not prescribed in the Contract Documents, the Contractor is free to use any methods or equipment that will accomplish the Work in conformity with the requirements of this Contract.

01510.1 DESCRIPTION

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

01510.2 PROTECTION OF EXISTING UTILITIES

01510.2.1 INTEGRITY OF UTILITIES

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

01510.2.2 LOCATING UTILITIES

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

01510.2.3 CHANGES TO UTILITIES

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

01510.2.4 MAINTENANCE OF SERVICE

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

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

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

01510.3 PROTECTION OF PROPERTY AND EXISTING STRUCTURES

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

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

01510.4 PROTECTION OF PAVED SURFACES

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

01510.5 RIGHTS-OF-WAY AND EASEMENTS

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

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

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

01520.1 DESCRIPTION

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

01520.1.1 RELATED WORK AND REFERENCED SECTIONS

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

01520.1.2 SUBMITTALS

Section 01300 – Submittals.

01520.1.3 DEFINITIONS

Not used

01520.2 MATERIALS

Not used

01520.3 CONSTRUCTION REQUIREMENTS**01520.3.1 EXPLOSIVES AND BLASTING**

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

01520.3.2 DUST ABATEMENT

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

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

01520.3.3 STORM AND GROUND WATER

01520.3.3.1 CONTROL MEASURES - The Contractor shall provide and maintain, at all times during construction, ample means and devices to promptly remove all water entering the Work, whether the water is surface or ground water. Water removed by the Contractor shall be directed into ponds or areas separated from live streams or drainage ways, to keep sediment from entering live water

- 01520.3.3.2 DRAINAGE PATTERNS - In excavation, fill, and grading operations, the Contractor shall take care, to disturb the existing drainage pattern as little as possible. Particular care shall be taken not to direct drainage water onto private property or into streets or drainage ways inadequate for the increased flow.
- 01520.3.3.3 FORDING OF WATERWAYS - Fording of live streams or any body of live water to accomplish the Work shall not be permitted. Mechanized equipment also shall not be operated in live water to accomplish the Work unless authorized in writing by the Engineer, or in the Contract Documents.
- 01520.3.3.4 FILLING OF WATERWAYS - The Engineer will not approve the filling of any ditches, washes, drainage ways, streams, wetlands, or other surface waters by the Contractor to accomplish the Work unless specific instructions are included in the Contract Documents which will provide for how the affected drainages or surface waters are to be treated.
- 01520.3.4 NOISE ABATEMENT
- In or near inhabited areas, particularly residential areas, the Contractor's operations shall be performed in a manner to prevent noise from becoming a nuisance or problem. Particular consideration shall be given to noise generated by repair and service activities during the night hours.
- 01520.3.5 CHEMICALS
- All chemicals and/or petroleum based products used during project construction or furnished for project shall be handled, applied and disposed of in strict accordance with the printed instructions of the manufacturer and regulations enforced by Federal, State and Local health authorities.
- 01520.3.6 WASTE AND SURPLUS MATERIALS DISPOSAL
- 01520.3.6.1 CLEAN WORK SITE - The Contractor shall keep the work site, haul roads and other areas of use in a neat, clean condition, free from any accumulation of surplus materials. It shall be the responsibility of the Contractor, at its own expense, to remove and legally dispose of all surplus materials resulting from all Work activities performed in accordance with the Contract Documents.
- 01520.3.6.2 SURPLUS MATERIAL - Surplus material includes, but is not limited to, salvaged materials and equipment that otherwise would have been abandoned in place, rocks too large to be used as backfill, wood and other organic or unsuitable materials, trash, rubbish, and waste products of any nature, and any other debris generated by the Work.
- 01520.3.6.3 REGULATORY COMPLIANCE - Disposal of surplus materials shall be accomplished in accordance with all local codes, laws, ordinances, and all applicable safety laws (particularly to the requirements of Part 1926 of the OSHA Safety and Health Standards for Construction) in effect at the approved disposal site. In no case shall it be acceptable for any surplus material to be disposed of in streams, marshes or wetlands.
- 01520.3.6.4 APPROVAL OF DISPOSAL - The Engineer will not approve any disposal operation, which creates an unsightly and/or unsanitary nuisance. The Contractor shall maintain disposal sites in a reasonable condition of appearance during construction. When designated and/or public disposal sites are unavailable, written approval must be obtained from the Engineer to dispose of any surplus materials on any other site. All disposal sites are subject to approval by the Engineer. The Contractor shall secure permission and all permits required for use of any dumpsite not previously arranged and designated by the Owner. The Contractor shall retain copies, and provide copies upon request, of all disposal permits and/or agreements obtained for the Contract Work.

- 01520.3.6.5 SCHEDULED REMOVAL - The Contractor shall establish regular intervals of collection and disposal of surplus materials during construction. Stockpiling of surplus materials for later disposal will not be approved or allowed.
- 01520.3.7 OPEN BURNING
- Open burning of materials may be allowed only in strict accordance with all regulations in effect for the area at which the burning would be performed, and the Contractor shall obtain any necessary permits from the appropriate governing entity prior to the start of burning. The Contractor shall not allow fire to spread beyond the material intended for burning. No accumulation of residue from burning shall remain on or adjacent to the construction site, without written approval of the Engineer.
- 01520.3.8 SANITATION
- 01520.3.8.1 TOILETS - The Contractor shall provide fixed or portable chemical toilets for employee use in conformance with the requirements of Part 1926 of the OSHA Standards for Construction and when public toilets are not available or within fifteen (15) minutes walking distance of the Work site.
- 01520.3.8.2 COLLECTION OF WASTES - The Contractor shall be responsible for daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor shall be disposed of away from the site in accordance with all laws and regulations pertaining thereto.
- 01520.3.9 HAZARDOUS MATERIAL
- 01520.3.9.1 REGULATORY COMPLIANCE - Disposition of any hazardous material or toxic or hazardous waste shall be made in accordance with the requirements and regulations administered by the State agency wherein the Work site is located.
- 01520.3.9.2 ABNORMAL CONDITIONS - Abnormal conditions include, but are not limited to, the following: buried barrels with liquid or solid contents; buried or above ground tanks with liquid contents; obnoxious odors; excessively hot earth; stained and discolored soils; smoke; unidentifiable powders, sludge, pellets; or any other similar condition.
- 01520.3.9.3 DISCOVERY AND NOTIFICATION - If any abnormal conditions are encountered during construction, which indicate the presence of a hazardous material, toxic, or hazardous waste, the Contractor shall immediately suspend work in the area of the discovery and notify the Engineer and treat the situation with extreme caution. The Contractor's operation in the area of discovery shall not resume until so directed by the Engineer; however, the Contractor shall continue working in other areas of the project, unless otherwise directed by the Engineer.
- 01520.3.9.4 DISPOSAL - When it becomes necessary for the Contractor to dispose of discovered materials, the work may be considered a change and administered in accordance with the General Conditions. Should the disposition of discovered waste material require special procedures or handling by certified personnel, the Contractor will make all such arrangements. When it becomes necessary to obtain permits for transporting or handling discovered material, the Owner will obtain the permits.
- 01520.3.9.5 SPILLS AND NOTIFICATION - In the event of spills of petroleum-based products or hazardous wastes by the Contractor, the Contractor shall immediately notify the Engineer. The Contractor shall also notify the appropriate State environmental enforcement agency, unless the spill consists of less than one (1) gallon of petroleum based products. In no case will notification be made later

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

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

01520.3.10 ENVIRONMENTAL COMPLIANCE

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

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

- DISCOVERY AND NOTIFICATION - If a suspected or unsuspected historic, archeological, or paleontological item, feature, or site is encountered, construction operations shall be immediately stopped in the vicinity of the discovery and the Engineer shall be notified of the nature and exact location of the findings. The Contractor shall not damage the discovered objects and shall provide written confirmation of the discovery to the Engineer within two (2) calendar days.
- RESTRICTION OF CONSTRUCTION - Should operations in the vicinity of a discovery be restricted, the Engineer will keep the Contractor informed concerning the status of the restriction. The Contractor should be aware that the time necessary for the Owner to negotiate the handling of the discovered is variable and is dependent on the nature and condition of the circumstances. It is possible that a delay of as much as three weeks in the vicinity of the discovery can be expected. The Engineer will inform the Contractor when the restriction is terminated. Changes required to accommodate delay or Work resulting from the discovery will be authorized in accordance with the General Conditions.

01520.3.11 OPERATIONS OUTSIDE OF THE PROJECT SITE

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

01520.3.11.2 CULTURAL RESOURCES (Archeological and Historic) - Clearance may require consultation with the State Historic Preservation Office.

01520.3.11.3 THREATENED AND ENDANGERED SPECIES - Compliance may require written clearance from the U.S. Fish and Wildlife Service.

01529.3.11.4 FLOOD PLAINS – May require consultation with the Federal Emergency Management Agency (FEMA) or corresponding state agency.

01520.3 11.5 WETLANDS AND OTHER BODIES OF WATER – May require consultation with the Army Corps of Engineers and/or appropriate state agency

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

01520.4 **METHOD OF MEASUREMENT**

Not used.

01520.5 **BASIS OF PAYMENT**

Not used.

01580.1 DESCRIPTION

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

01580 1 1 RELATED WORK AND REFERENCED SECTIONS

Not used

01580.1 2 SUBMITTALS

Required submittals are described in SP13110.

01580 1 3 DEFINITIONS

Not used

01580.2 WORK SITE ACCESS**01580 2 1 INVESTIGATION OF WORK SITE AREA**

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

01580 2 2 HAUL ROADS

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

01580 2 3 USE OF PUBLIC STREETS AND ALLEYWAYS

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

01580 2 4 CLOSURE OF PUBLIC ROADWAYS

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

01580 2 5 INTERFERENCE WITH UTILITIES

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

01580.3 PUBLIC SAFETY AND ACCESS

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

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

01580.4 CONTRACTOR'S USE OF THE WORK SITE

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

01580.5 OFF-SITE STORAGE

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

01580.6 COOPERATION WITH OTHER CONTRACTORS

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

PART 3

MOBILIZATION

02000.1 DESCRIPTION

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

02000 1 1 RELATED WORK AND REFERENCED SECTIONS

Section 01200 - Contract Closeout
 Section 01510 - Protection of Existing Property
 Section 01520 - Environmental Controls
 SP13110 - Test Well Construction

02000.1 2 SUBMITTALS

Required submittals are described in SP13110.

02000.2 MATERIALS

Required materials are described in SP13110.

02000.3 CONSTRUCTION REQUIREMENTS

Construction requirements are described in SP13110.

02000.4 METHOD OF MEASUREMENT

Mobilization shall be measured by the lump sum.

02000.5 BASIS OF PAYMENT

2000 5 1 The accepted quantity(s) shall be paid for at the contract unit price for:

PAYMENT ITEM	UNIT
Mobilization	Lump Sum

02000.5.2 PAYMENT SCHEDULE

The amount bid or identified in a schedule of values for Mobilization shall not exceed 10% of the total contract bid amount. The following payment schedule percentages shall be based on amount bid or identified in a schedule of values for Mobilization up to a maximum of 10% of the total contract bid. Any portion of the mobilization bid amount which exceeds 10% of the total contract bid amount will be paid to the Contractor after final acceptance of the Work, with the last mobilization payment. (See "overage amount" in the payment schedule table below).

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

MOBILIZATION PAYMENT SCHEDULE

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

PART 4

SPECIAL CONSTRUCTION

SPECIAL PROVISION

TEST WELL CONSTRUCTION	SECTION SP13110
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13110.1

DESCRIPTION

This section covers construction of two test wells (Test Wells #1 and #2) in the vicinity of the Central Utah Correctional Facility in Gunnison, Utah, which includes furnishing all materials, equipment, and labor to: drill, install casing, perforate part of the casing or install a screen (depending on the drilling method to be used), develop, perform pumping tests, clean and remove equipment and materials and abandon test wells. If any requirement in this Section is found to be in conflict with other pertinent Utah Drinking Water Regulations, the more stringent requirements shall govern unless otherwise directed by the Engineer.

13110.1.1

SCOPE OF WORK

- A. The Contractor shall choose one of the drilling methods: cable tool, air rotary and/or reverse circulation drilling methods to construct one or two 10-inch diameter test well(s) to a depth of approximately 600 feet. The target production will be 800 gallons per minute (gpm). The results of Test Well #1 will be one of the factors to determine whether Test Well #2 will be drilled. If Test Well #1 produces 800 gpm or more, Test Well #2 will not be drilled. Drilling Test Well #2 will depend on (1) the result of the pumping test at Test Well #1 that would demonstrate insufficient flow and (2) sufficient funds available. The alternate bid for the 2nd test well can be accepted by the OWNER for a period of 30 days following the test results for the 1st test well. The acceptance of the 2nd test well within this period shall not result in an additional mobilization fee by the CONTRACTOR. The location of the two test wells is shown on the drawings in the Appendix.
- B. The Contractor shall install a conductor casing to a depth of 50 feet if the rotary drilling method is chosen or 100 feet if the cable tool drilling method is chosen. The diameter of the conductor casing will be depending on the drilling method to be used. If the cable tool drilling method is chosen, the diameter of the conductor casing will be 18 inches. If the rotary drilling method is chosen, the diameter of the conductor casing will be 22 inches.
- C. If the rotary drilling method is chosen, the Contractor shall drill a 14-inch diameter test well hole to a depth of 600 feet. If the cable tool drilling method is chosen, the Contractor shall drive a 10-inch diameter casing into a depth of approximately 600 feet.
- D. The Contractor shall complete a Lithologic Log of each test well to determine the most accurate location and thickness of each water-bearing stratum, including a short descriptive summary of the materials encountered with depth. Lengths and locations of perforated sections in the well casing will be determined based on this data. To meet this requirement, the Contractor shall collect samples at 5-foot intervals. Each sample shall be placed in a bag and labeled to indicate the sampling interval. These samples shall be available to the Owner and the Engineers any time.
- E. If the rotary drilling method is chosen, the following tasks shall be performed:
- (1) The Contractor shall perform a geophysical logging survey for each well hole.
 - (2) After the geophysical logging survey is completed and reviewed by the Engineers, the Contractor shall install a 10-inch diameter (10" OD) well casing column and a screen to a depth of 600 feet at each test well. The length of the casing and screen will be determined by the Engineers based on the geophysical logging survey. The screen size will be determined by the Engineers based on

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laboratory gradation analyses of representative samples. After the lengths of the casing and screen and the size of the screen are determined, the Contractor will deliver and install the casing and screen.

(3) Based on laboratory gradation analyses of representative samples and the geophysical logging survey, the Engineers will determine the size and quantity of a gravel pack. The Contractor shall provide and place the gravel pack.

(4) The Contractor shall develop the well with the rig for 8 hours.

- F. If the cable tool drilling method is chosen, the Engineers will review the drilling log with the Contractor and determine the perforation interval and size. The Contractor shall perforate with a Mills knife the casing as recommended by the Engineers.
- G. The Contractor shall install pumping test equipment to a depth of up to 500 feet at each test well, and perform pumping tests for the test wells as directed by the Engineer. If the cable tool drilling method is chosen, the Contractor shall develop the well for 8 hours before performing pumping tests.
- H. If the pumping test indicates the test well is a desirable producer determined by the Owner and/or the Engineer, the test well will be converted to a production well. The Contractor shall contact the Utah Division of Drinking Water to schedule a date for construction of the surface seal so that a representative from the Division can supervise the construction. The Contractor shall provide the material and necessary equipment for the installation of the surface seal for each well extending from the ground surface to a depth of 100 feet below grade.
- I. The Contractor shall not allow any dirt or mud to leave the project site. The Contractor may, at his own cost, install a gravel base at an appropriate location on the project site used for a dirt containment system / wash down area.
- J. The Contractor shall abandon the test well should the pumping test results indicate the test well is not a desirable producer.

13110.1.2 SUBMITTALS

All submittals shall be made in accordance with Section 01300 of these Specifications and any other requirements stated herein.

13110.1.2.1 CUTTING SAMPLES – See 13110.3.2.3

13110.1.2.2 WELL LOG AND DAILY REPORT – See 13110.3.2.4

13110.1.3 DEFINITIONS

Abandoned Well - A well which is not in use and has been filled or plugged so that it is rendered unproductive and will prevent contamination of groundwater. A properly abandoned well will not produce water nor serve as a channel for movement of water from the well or between water-bearing zones.

Air Line - A small vertical air pipe usually extending from the surface and submerged to within a few feet of the bottom of the eductor pipe.

Annular Space - The space between the inner well casing and the outer well casing or borehole.

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Aquifer - A porous underground formation yielding with drawable water.

Artesian Well - A water-bearing formation which contains underground water under sufficient pressure to rise above the zone of saturation.

Bailer - An elongate pipe bucket with a valve at the bottom used to remove cuttings from the drill hole.

Bentonite - A highly plastic, colloidal clay composed largely of mineral montmorillonite

Casing - A tubular retaining and sealing structure that is installed in the borehole to maintain the well opening.

Cementing - A technique of installation of cement materials by pumping or pouring from the bottom of the zone upward via a tremie pipe extending to the surface.

Clay - A fine-grained inorganic material (grains less than 0.0005 mm in diameter) which is plastic and has very low permeability.

Conductor Pipe - A tubular retaining structure installed between the drill hole and the inner casing, in the upper portion of a well.

Curing Time - Minimum time required for particular types of cementing or grouting materials to harden (or set up) before drilling or other construction operations can be resumed.

Drawdown - The difference in elevation between the static and pumping water levels.

Drilling Mud - A fluid composed of water and bentonite used in the drilling (primarily rotary) operation to remove cuttings from the hole, to clean and cool the bit, to reduce friction between the drill stem and the sides of the hole, and to plaster the sides of the hole. Such fluids range from relatively clear water to carefully prepared mixtures of special purpose compounds.

Drive Shoe - A forged steel collar with a cutting edge fastened onto the bottom of casing to shear off irregularities in the hole as the casing advances, and to protect the lower edge of the casing as it is driven.

Eductor - The vertical discharge pipe connected to the submerged pump or pump bowls.

Filtering - The configuration of openings and/or screen material installed in the well casing to allow entry of water into the well.

Gravel Packed Well - A well in which filter material is placed in the annular space to increase the effective diameter of the well, and to prevent fine-grained sediments from entering the well.

Groundwater - Subsurface water in the zone of saturation.

Grout - A fluid mixture of Portland cement or Bentonite with water of a consistency that can be forced through a pipe and placed as required. Various additives, of sand, bentonite and hydrated lime, may be included in the mixture to meet certain requirements.

Lift - The vertical distance from the pumping level to the point of discharge of the water plus the friction loss in the eductor pipe.

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Packer - A device placed in a well which plugs or seals the well at a specific point

Perforations - A series of openings in a well casing, made either before or after installation of the casing, to permit entry of water into the casing.

Permeability - The ability of a medium (porous geological strata, etc) to transmit water.

Static Level - Stabilized water level in a non-pumped well beyond the area of influence of any pumping well.

Telescoping - a method of fitting or placing one casing inside another, or of introducing screen through a casing diameter larger than the diameter of the screen.

Test Well - Well completed only to a point sufficient for test sampling and/or pumping.

Transmissivity - The rate at which water is transmitted through an aquifer.

Tremie Pipe - A device that carries materials to a designated depth in a drill hole or annular space.

Water-Cement Ratio - The amount of mixing water in gallons used per sack of cement.

Water Table - The levels at which water stands in wells.

Well Logging - Logging consists of several different techniques and observations that measure and record electrical, physical, chemical, or radio-active properties of the drill hole wall surface and water

Well Point - A short length of well screen attached to the lower end of the pipe for the purpose of de-watering an aquifer or other formation. It is driven into position in the aquifer or formation via repeated blows. Usually, a forged steel point is attached to the lower end of the screen to facilitate penetration.

Well Screen - Serves as the intake section of the well that obtains water from an aquifer of unconsolidated materials such as sand. It allows water to flow freely into the well from water saturated sand, prevents sand from entering with the water and serves as a structural retainer to support the bore hole in unconsolidated material

13110.2 MATERIALS

All materials shall meet AWWA Standard A-100, ASTM or API specifications found in R655-4 of the Utah Administrative Code (Administrative Rules for Water Well Drillers, adopted January 19, 1995, Division of Water Rights), and shall consist of the following:

13110.2.1 CASING

WELL CASING – Well casing shall project at least 18 inches above the anticipated final ground surface. Well casing shall be mild steel spiral welded casing meeting the requirements of ASTM A-139-061, Grade B, of the size shown in the table below.

Casing Application	Diameter (Inches)	Minimum Wall Thickness (inches)
Steel Casing	10	0.250

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- 13110.2.2a WELL PERFORATION – This item only applies to the cable tool drilling method. Well casing perforation intervals shall be approximately 300 feet for each test well. The actual length and location of perforation intervals shall be determined after the well drilling is completed. Perforation parameters shall be determined based on materials encountered.
- 13110.2.2b WELL SCREEN – This item only applies to the rotary drilling method. Approximately 300 feet of the well (refer to the Appendix) shall be screened using continuous wedge wire wrapped 304 stainless steel well screen. The actual length and location of screen intervals shall be determined after the well drilling is complete. Screen parameters shall be determined based on sieve analysis of formations and gravel pack materials.
- 13110.2.3 CASING GUIDES
- If necessary, casing guide shall be 5/16-inches thick, 2-inches in width, and 30-inches in length and shall be made of the same material as the well casing or screen sections to which they are attached.
- 13110.2.4 GROUT
- Grout shall not be used for test well construction until the Owner and the Engineer have decided to convert the test well to a production well. If necessary, any type described below may be used. The use of special cements, bentonite to reduce shrinkage, or other admixtures (ASTM C494) to reduce permeability, increase fluidity, and/or control time of set and the composition of the resultant slurry must be approved by the Engineer. Concrete grout consists of a mixture of Portland cement (ASTM C150), sand and water. The mixture shall include not more than one part by weight of sand and one part of cement and not more than six gallons of clean water per bag (1 cubic foot or 94 pounds) of cement. Neat cement grout consists of a mixture of Portland cement (ASTM C150) and not more than six gallons of clean water per bag (1 cubic foot or 94 pounds) of cement.
- 13110.2.5 CASING COLLARS
- When specifically authorized by the Engineer for joining sections of casing, collars shall be of the same thickness and material as the corresponding casing section. Collar width shall be 6 inches and they shall be rolled to fit the outside diameter and then welded to the casing section. The inside edge of collars shall be ground or sufficiently scarified perpendicular to the axis of the casing so as to not vary more than 0.010 inch from a true plane at right angles to the axis of the casing. Three 1 inch by 3/8 inch alignment holes shall be provided in each collar to insure proper matching of the sections.
- 13110.2.6 BENTONITE SEALING MATERIAL
- Due to the fact that the annular space between the drill hole and well casing is not 6 inches or more, bentonite sealing for this well is prohibited if a surface seal is required.
- 13110.2.7 TREMIE PIPE
- This item only applies to the rotary drilling method. A Tremie pipe shall be 1½-inch galvanized pipe extending from the bottom of the water production zone to the top of the well casing. A refill section, installed in accordance with the Drinking Water Regulations shall be included at the top of the Tremie pipe.
- 13110.2.8 WELL CASING PERFORATIONS

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This item only applies to the cable tool drilling method. The Contractor shall use a Mills knife to perforate the well casing. The placement of perforations shall be made after an examination of the drill cuttings in combination with a study of the driller's log. In general, the placement of perforations in the well casing shall be so located to permit as far as practical the uniform collection of water around the circumference of the well casing, and be of dimensions and size to restrain the water bearing materials from entering into the well.

13110.2.9 **GRAVEL PACK**

This item only applies to the rotary drilling method. Gravel pack shall be more than 95% of siliceous material (SiO₂), having a sphericity of 0.8+ and a roundness of 07+ to minimize bridging, settling, and compaction while maintaining a porosity of more than 45%, as distributed by Colorado Silica Sand, Inc., or approved equivalent. Grain size and grading of the gravel pack shall be determined based on sieve analysis of formations. The mixture shall be delivered in sealed, 1 cubic-foot minimum bags to the well site. The bags shall be protected against damage and/or contamination from dirt or moisture during storage. The gravel pack shall be disinfected in accordance with the requirements of ANSI/AWWA A-100.

13110.2.10 **WATER FOR CONSTRUCTION**

The Owner will make water for construction available at no cost to the Contractor. The Contractor will be responsible for furnishing all labor, materials, and equipment deemed necessary for transporting and storing the water for drilling purposes.

13110.3 CONSTRUCTION REQUIREMENTS

13110.3.1 **SITE PREPARATION, PROTECTION, TEMPORARY FACILITIES AND ACCESS**

13110.3.1.1 The test well sites shall be located at locations approved by the Owner and the Engineer prior to drilling rig setup. The Contractor shall set up his rig on site. If required, additional clearing, grubbing and site leveling shall be performed as necessary.

13110.3.1.2 The Contractor shall repair any damage to the properties near the well sites at no expense to the Owner. The Contractor shall be also responsible for snow removal when necessary as part of mobilization to and from the site.

13110.3.1.3 The Contractor shall take measures to ensure that the site is protected from diesel fuel, oil, or other contaminants that may be inherent with drilling equipment. Immediately beneath the drill rig or other contaminant producing equipment, the contractor shall install plastic to ensure that possible oil or fuel leaks are contained. Any garbage or debris that is brought in by the Contractor shall be removed from the site.

13110.3.1.4 The Contractor shall comply with all local, County, State and Federal noise ordinances and regulations.

13110.3.1.5 The Contractor shall be responsible for the safety and security of the project site. The Contractor shall provide all necessary temporary controls, including, but not limited to barricades, fencing, and signage required for protection of the public and the work. All costs associated with safety and security controls shall be included in the Contractor's bid amount. All temporary controls shall be removed from the site at the completion of the work at no additional cost to the Owner.

13110.3.2 **DRILLING**

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13110.3.2.1 CONSTRUCTION METHODS - Drilling shall proceed in accordance with the requirements of ANSI/AWWA A-100 The Contractor shall use the Cable Tool or Air or Reverse Rotary Drilling Method for construction of the test wells.

13110.3.2.2 CUTTING SAMPLES – As drilling proceeds, formation samples shall be collected at intervals not exceeding 5 feet and at the depth of each formation change observed thereafter to the total depth of the drill hole. Unless otherwise authorized by the Engineer, each sample shall be retained in a vinyl plastic bag, labeled to identify its specific location in the hole and shall be available to the Engineer any time.

13110.3.2.3 WELL LOG – During the drilling of the well hole, the Contractor shall work with the Geologist or Engineer and shall make appropriate measurements and maintain a lithologic log which shall include the following:

- The reference point for all depth measurements.
- The depth at which each change of formation occurs.
- The depth at which the first water was encountered.
- The depth at which each stratum was encountered.
- The thickness of each stratum.
- The identification of the material of which each stratum is composed, such as:
 - ⇒ Clay
 - ⇒ Sand or Silt
 - ⇒ Sand and Gravel - indicating whether gravel is loose, tight, angular or smooth; color
 - ⇒ Cemented Formation - indicating whether grains (if present) have natural cementing material between them, e.g. silica, calcite, etc.
 - ⇒ Hard Rock - indicating whether sedimentary bedrock, or igneous (granite-like, basalt-like, etc)
 - ⇒ Fracturing condition
- The depth interval from which formation sample was taken.
- The depth at which the hole diameter (bit size) changes.
- The depth to the static water level (SWL) and changes in well depth.

DAILY REPORT – In addition to the Well Log, the Contractor shall maintain a daily report, which shall be delivered, upon request, to the Engineer. The report shall give a complete description of all formations encountered, number of feet drilled, number of hours on the job, shutdown due to breakdown, the water level in the well at the beginning and end of each shift, water level at each change of formation if readily measurable with the drilling method used, footage of casing set, and such other pertinent data as maybe requested by the Engineer

13110.3.2.4 WATER SAMPLING – The Contractor is responsible to help the Engineer collect water samples at the conclusion of pumping tests.

13110.3.2.5 VERIFICATION OF PLUMBNESS AND ALIGNMENT – The Contractor shall verify alignment and plumbness prior to development and testing of the well. This shall be accomplished in accordance with the requirements of ANSI/AWWA A-100. Should the plumbness or alignment of the well fail to meet the requirements of ANSI/AWWA A-100, the Contractor shall make appropriate adjustments to the well as necessary, at its own expense. Should the Contractor fail to correct faulty alignment and plumbness, the Owner may refuse to accept the well.

13110.3.3 WASTE CONTROL

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The Contractor shall supply and maintain piping and holding facilities of sufficient size to safely and satisfactorily accommodate water, fluid and other materials removed from the well hole, so as to not create a nuisance or hazard to the surrounding environment. No debris or water shall be allowed to be moved/discharged to adjacent properties. Material removed during drilling shall be contained and small particles within the water must be settled out before discharging into any drain system. The Contractor shall be responsible for containing, loading, and transporting all filings to an off-site location approved by the Owner and the Engineer.

13110.3.3.1 The Contractor shall take appropriate measures to prevent erosion caused by water resulting from drilling and test pumping operations. The Contractor shall supply temporary piping as required from the well site to a drain system near the well site to discharge water from test pumping.

13110.3.4 CLEANLINESS AND DISINFECTION OF WELL MATERIALS AND COMPONENTS

All parts and materials installed in the well shall be cleaned and disinfected prior to incorporation into the well. Well column piping shall be scrubbed if necessary to remove any oil or grease, and sprayed with a chlorine solution, then rinsed with clean water before installation.

13110.3.5 CASING

13110.3.5.1 CONSULTATION – Before proceeding with installation of any well casing, the Contractor shall consult with the Engineer and obtain instructions.

13110.3.5.2 MEASUREMENT AND MARKING– The Contractor shall measure and record the lengths of all casing and then clearly mark and number the top end of all casing sections before any casing is placed in the drill hole. This information shall be delivered to the Owner.

13110.3.5.3 CASING INSTALLATION – Installation of the well casing shall be accomplished by lowering, driving with a drive shoe, driving with a well point, or jacking. Full penetration butt welds shall be used to join lengths of well casing so that any resulting joint shall be watertight and have the same structural integrity as the casing itself.

13110.3.5.4 Three casing guides shall be equidistantly spaced around the well casing at 40-foot intervals measured from the bottom of the well casing, unless otherwise directed by the Engineer. Casing guides shall be of the same material as the casing to which they are attached.

13110.3.6 WELL CONTAMINATION

The Contractor shall take such precautions as necessary to prevent contaminated water or other materials from entering the well. In the event that the well becomes contaminated or if water having undesirable physical or chemical characteristics does enter the well due to the neglect of the Contractor, the Contractor shall perform such work or supply such materials as may be necessary, and at no additional cost to the Owner, to eliminate the contamination. If the contamination to the well does not result from neglect or action on the part of the Contractor, the work required to remove such contamination shall be treated as a change in accordance with Section 00700.13 of the General Conditions.

13110.3.7 GROUTING

Grouting shall not be required for the test wells construction project until the Owner and/or Engineer has determined to convert the test well to a production well. If required, the Contractor shall notify the appropriate regulatory officials to proceed with grout placement. The State Regulatory Officials must witness grout placement during well construction. Grouting shall be

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accomplished with suitable pumps and Tremie pipes. Grout shall be installed under pressure from the bottom of the zone to be grouted. The top 100 feet of the well annulus shall be sealed with grout unless otherwise directed by the Engineer.

Protection shall be provided to prevent leakage of grout into any gravel pack or screen section. This shall be accomplished, at the Contractor's option, through the use of packers or by other industry standard method, which is approved for use by the State of Utah Drinking Water Regulations.

13110.3.8 GRAVEL PACKING

This item only applies to the rotary drilling method. A gravel pack shall be installed from the bottom of the well to the grout seal, as directed by the Engineer, and in accordance with the State of Utah Drinking Water Regulations. The Contractor shall be responsible to ensure that the gravel material is adequately protected from contamination during storage and disinfected during installation as required by the State of Utah Drinking Water Regulations. The gravel pack material shall be placed and then slowly raising the Tremie pipe as the packing progresses. Water shall be pumped into the Tremie pipe to help carry the gravel material. The gravel pack shall be placed in one uniform and continuous operation and shall be disinfected during installation. Following installation, the gravel pack shall be cleaned. Cleaning shall be accomplished by surging water back and forth through each screen until the water pumped from the well is reasonably clear. While the cleaning progresses, the level of the gravel pack in the well annulus shall be examined. If the level of the gravel pack drops during the process of cleaning, additional gravel pack material shall be placed through the Tremie pipe to maintain the pack level as prescribed in the well design until the cleaning is complete.

13110.3.9 DEVELOPMENT

13110.3.9.1 Prior to development pumping, the entire well casing shall be swabbed and flushed with water until clean. All mud, debris, and foreign material shall be removed from the well casing.

13110.3.9.2 Development pumping shall be started within 5 days after completion of swabbing and flushing of the well. The Contractor shall furnish, install, operate and remove a pump system for developing the well, which is sized to be capable of providing a pumping rate twice the amount of production indicated in the Scope of Work in this Section. The flow rate of the pump shall be variable from the lowest amount the test pump will produce to the maximum pumping rate with the accuracy range required by ANSI/AWWA A-100.

13110.3.9.3 Usually, pumping starts at a relatively low rate and the pumped water carries particulate and/or color. If neither is observed, the pumping rate shall be slowly increased. Once sand and/or color in the discharge are observed, the pumping rate shall be maintained while the water level is monitored. Pumping shall be continued until the discharging water becomes clear and the sand content in the water has dropped considerably. When a fairly stable water level at a pumping rate is reached, the pumping shall be stopped to surge the well through the screened or perforated area. After a 5-minute recovery, the pumping shall be resumed at the rate when it was shut off. The process described herein shall be repeated until an increase in pumping rate is necessary to continue the development.

13110.3.9.4 The pumping rate shall be increased only when the repeated pumping and surging process at that rate does not remove any sand and/or colored water from the well. Pumping shall never be stopped, nor shall the well be surged, while large quantities of sand are being carried with the discharging water. The pumping rate shall be incrementally increased, with periodic surging at each stage. These cycles of pumping and surging shall be repeated until the discharged water is

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clear of mud, sand, and silt when the maximum pumping rate determined by the Engineer is reached

13110.3.10 TESTING

13110.3.10.1 The well shall stand idle for at least one day prior to test pumping, or the static water level in the well shall be fully recovered. Test pumping shall be continuous until a steady-state condition has been reached (a minimum of six hours unless otherwise directed by the Engineer) or for 24 hours. The Contractor must maintain a pumping test record (see the sample Pump Test Record Sheet included at the end of this section)

13110.3.10.2 Time intervals for water level readings provided for aquifer parameter analysis are as follows:

- Measure every 0.5-1 minute during 0-10 minutes after start of test;
- Measure every 1-3 minutes during 10-15 minutes after start of test;
- Measure every 5-10 minutes during 15-60 minutes after start of test;
- Measure every 10-30 minutes during 60-300 minutes after start of test;
- Measure every 30-60 minutes during 300-1440 minutes after start of test;
- Measure every 60-480 minutes beyond 1440 minutes after start of test to test termination.

13110.3.10.3 To accomplish Performance Test Pumping, the Contractor shall:

- Furnish the discharge pipe necessary to transmit water away from the pumping unit to an area where the full pump test rated flow over long periods of time will not erode or damage the land. The Contractor shall also furnish, install and maintain equipment of appropriate size and type for measuring the flow of water; such equipment may be weir box, orifice or water meter
- Except as otherwise noted, the Contractor shall furnish all equipment, labor, power, and all necessary tools, materials, and supplies required and shall operate the pumping unit at such rates of discharge and for such periods of time as directed. Accidental interruptions of test pumping for a period of time may, if so agreed, extend the time of the completion of the test run by a corresponding amount of time. After completion of the final test the Contractor shall remove any sand, stones or other foreign material that may have become deposited in the well.
- The Contractor shall keep a record of the pump testing. This record shall include: a) test pump capacity versus head characteristics, b) static water level, c) depth of test pump setting, d) time of starting and ending each test cycle. The Contractor shall also provide recordings and graphic evaluation at one-half hour intervals or less of the following: a) pumping rate, b) pumping water level, c) drawdown, and d) water recovery rate levels after the pump is shut off.
- Step drawdown tests should be conducted after the static water level has stabilized for at least 12 hours. The well shall then be pumped at 3-4 different step rates as directed by the Engineer. Each step shall be pumped as directed by the Engineer, but for a minimum of 2 hours. During each step period, the well water level shall be measured and recorded in accordance with the time intervals recommended in paragraph 13110.3.10.2 above or as otherwise directed by the Engineer.
- After the step drawdown tests, the well shall stand idle until the static water level in the well is fully recovered. The well shall then be pumped for at least 24-hours at the maximum possible rate determined by the Engineer, and water level measurements shall be taken as described in 13110.3.10.2 and checking the constant discharge. Water level recovery measurements shall be taken immediately following the completion of the test pumping. Under the direction of the Engineer, water samples shall be collected in special sample bottles at the end of the pumping test.

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13110.3.11 FINAL DISINFECTION

Final disinfection is not required for test well construction

13110.3.12 WELL CASING REMOVAL AND WELL ABANDONMENT

13110.3.12.1 After test pumping and approval by the Engineer, the Contractor shall remove all equipment from the well. The Contractor shall also remove the well casing if possible for abandoning the test well.

13110.3.12.2 The Contractor shall use neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout to abandon the test well. Drilling mud or drill cuttings shall not be used as any part of a sealing material for well abandonment. The liquid phase of the abandonment fluid shall be water from a potable municipal system. State abandonment procedures shall be followed.

13110.4 METHOD OF MEASUREMENT

Measurement of the various pay items included on the Bid Schedule associated with water well construction shall be made according to the following paragraphs. Items not listed on the Bid Schedule are considered incidental to other work items

13110.4.1 Mobilization: By the lump sum.

13110.4.2 Conductor Casing: By measuring the lineal footage of casing materials used in the drill hole.

13110.4.3 Well Drilling: By measuring the lineal footage of depth of the hole drilled, sampled and logged, measured from the original ground surface to the bottom of the hole.

13110.4.4 Geophysical Logging: By the lump sum.

13110.4.5 Casing: By measuring the lineal footage of casing materials used in the drill hole.

13110.4.6 Screen: By measuring the lineal footage of screen.

13110.4.7 Casing Perforation: By measuring the lineal footage of perforated casing.

13110.4.8 Tremie Pipe: By measuring the lineal footage used in the drill hole.

13110.4.9 Gravel Packing: By counting the cubic yardage of material used in the drill hole.

13110.4.10 Conductor Casing Removal or Perforation: By the lineal footage to be removed.

13110.4.11 Grout: By the lineal footage to be grouted

13110.4.12 Test Pump Furnishing, Installation and Removal: By the lineal footage

13110.4.13 Development Pumping: By the hour.

13110.4.14 Test Pumping: By the hour

13110.4.15 Well Abandonment: By the lump sum.

13110.4.16 Well Driller's Report Preparation: By the lump sum.

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13110.5 BASIS OF PAYMENT

13110.5.1 The accepted quantities will be paid for at the contract unit price.

PAY ITEM	UNIT
Mobilization	Lump Sum
(Size)" Diameter Conductor Casing	Lineal Foot
(Size)" Diameter Hole Drilling and Well Log Preparing	Lineal Foot
Geophysical Logging	Lump Sum
(Size)" Diameter Casing Furnishing and Installing	Lineal Foot
(Size)" Casing Perforation	Lineal Foot
(Size)" Screen	Lineal Foot
Tremie Pipe	Lineal Foot
Gravel Packing	Cubic Yard
Furnish, Install and Remove Test Pump	Lineal Foot
Development Pumping	Hour
Test Pumping	Hour
Conductor Casing Removal or Perforation	Lineal Foot
Surface Seal	Lineal Foot
Well Abandonment	Lump Sum
Well Driller's Report Preparing	Lump Sum

APPENDIX
CONTRACT DRAWINGS

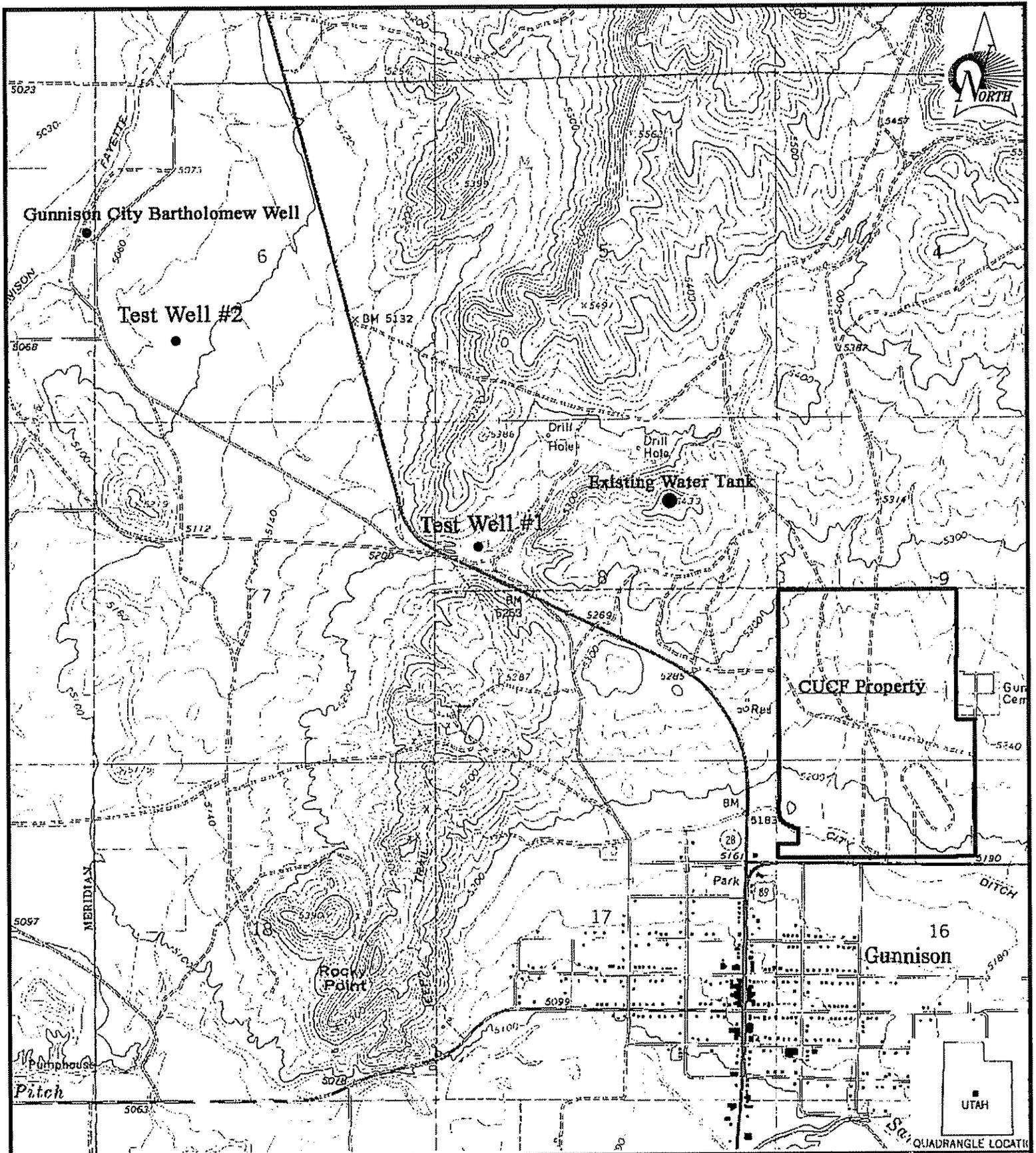


FIGURE 1. SITE VICINITY MAP
 Test Wells #1 and #2
 Gunnison, Utah

SUNRISE ENGINEERING, INC.
 CONSULTING ENGINEERS & LAND SURVEYORS

12227 South Business Park Drive, Suite 220
 Draper, Utah 84020
 TEL (801) 623-0100
 FAX (801) 583-0222

Designed by: DY
 Checked by: VK
 Date: 9/30/05

Scale in Feet



SUNRISE ENGINEERING

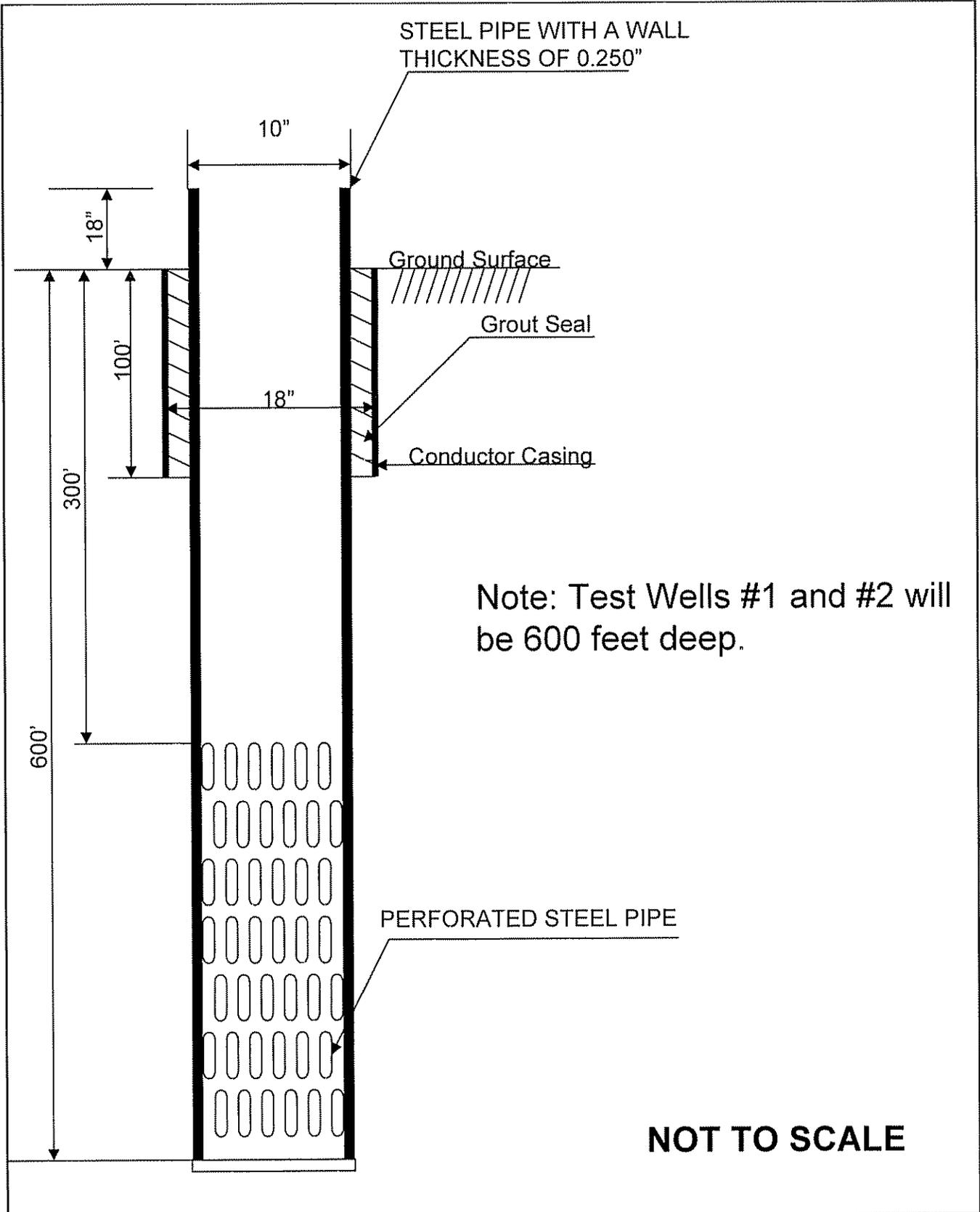


FIGURE 2. WELL DESIGN – CABLE TOOL DRILLING METHOD
 Test Wells #1 and #2

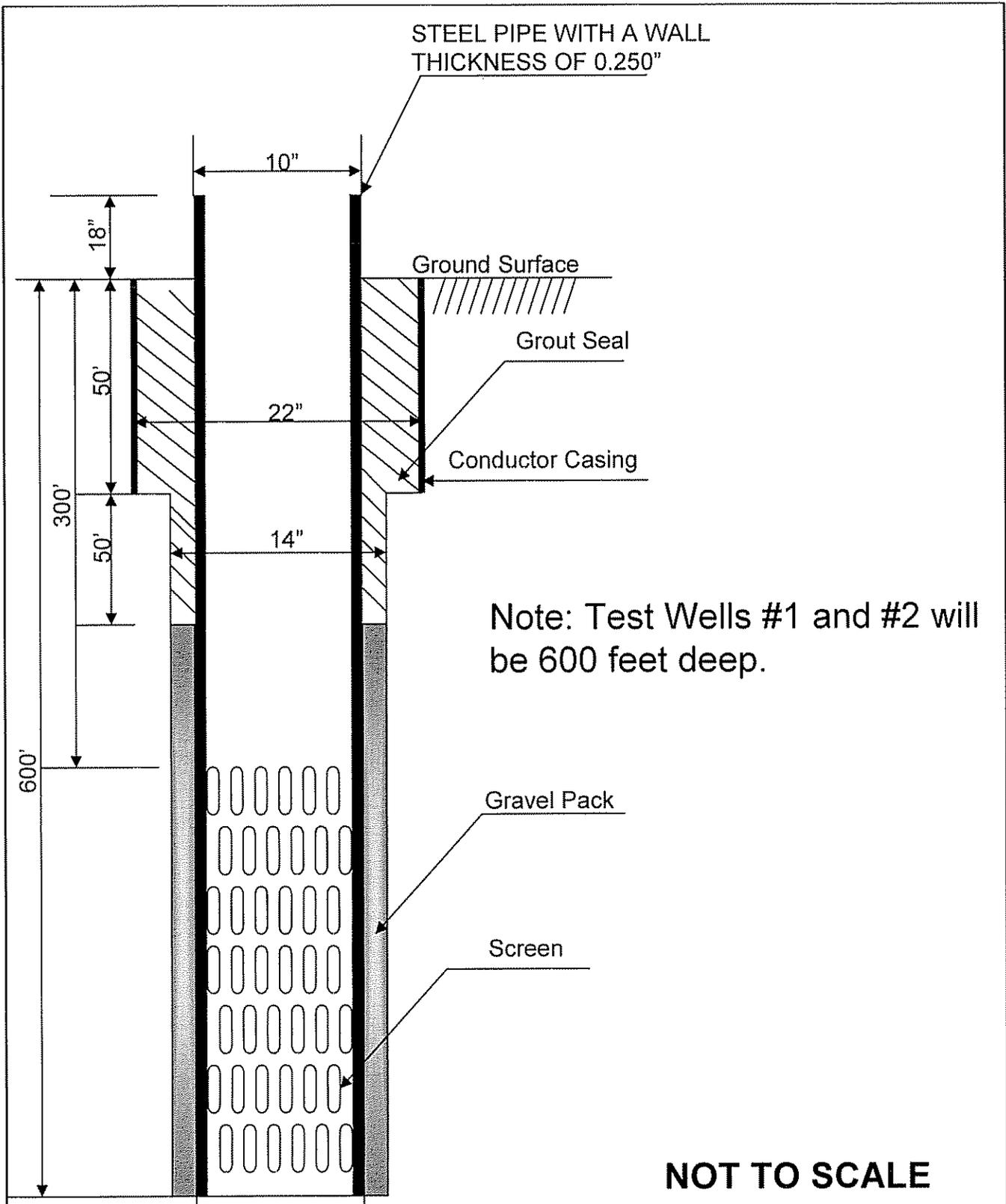


FIGURE 3. WELL DESIGN – ROTARY DRILLING METHOD
 Test Wells #1 and #2