

**CITY OF GREELEY
INVITATION FOR BID**

Linn Grove Irrigation Wells - BID

F24-08-071

**Due September 5, 2024, at 2:00 p.m.
(MST)**



**Serving Our
Community
It's A Tradition**

*The Office of the Purchasing Manager is a service division
established to build effective partnerships through efficient and responsive
procurement processes to obtain high quality
goods and services for the best value.*

SECTION 00110
BID #F24-08-071

INVITATION FOR BID

The City of Greeley, Colorado is requesting **sealed** bids for **F24-08-071 - Linn Grove Irrigation Wells -BID before September 5, 2024, at 2:00 p.m. (MST)** emailed to purchasing@greeleygov.com. No late or faxed bids will be accepted. It is the responsibility of the vendor to ensure the solicitation documents are delivered to the correct address as noted in the Solicitation Documents. Solicitations delivered to other City of Greeley email addresses may be deemed as late and not accepted.

The City of Greeley disseminates all bids and requests for proposals through the Rocky Mountain E-Purchasing System site. Go to <https://www.bidnetdirect.com>, then "Bid Opportunities" and then select "The City of Greeley". Bids submitted to the City of Greeley must include Sections 00120, 00130, 00140 and 00160. Addenda must be acknowledged in Section 00120 of the bidding documents. Bidders failing to acknowledge any and all addenda may be considered non-responsive.

Each bid shall be accompanied, by a certified check drawn on a bank which is insured by the Federal Deposit Insurance corporation or a bidder's bond executed by a surety company authorized to do business in Colorado, made payable to the City of Greeley, Colorado, in an amount not less than five percent (5%) of the proposal sum as security that the successful bidder will enter into a contract to construct this project in accordance with the plans and specifications, and give bonds in the sum as hereafter provided. Checks accompanying bids not accepted will be returned.

The successful responsive and responsible bidder will be required to furnish a satisfactory performance bond and payment bond in the amount of the contract sum.

No bid shall be withdrawn after the opening on the bids without the consent of the City of Greeley, Colorado, for a period of sixty (60) days after the scheduled time of the receiving the bids.

Bid acceptance and bid evaluation. Bids shall be evaluated based on the requirements set forth in the invitation for bids, which may include criteria to determine acceptability such as inspection, testing, quality, workmanship, delivery and suitability for a particular purpose. Those criteria that will affect the bid price and be considered in evaluation for award shall be objectively measurable, such as discounts, transportation costs and total or life cycle costs. The invitation for bids shall set forth the evaluation criteria to be used. No criteria may be used in bid evaluation that are not set forth in the invitation for bids.

The City of Greeley retains the right to reject any and all bids and to waive any informality as deemed in the best interest of the city.

Questions pertaining to the project may be directed to purchasing@greeleygov.com before August 20, 2024, by 2:00 PM (MST).

Schedule of Events (subject to change)	All times are given in local Colorado time
Bid Proposal Issued	8/09/2024
Mandatory Pre-Bid Conference include date/time and location	8/15/2024 at 12:30 p.m. at City Center South, 2 nd floor, Colorado Conference Room
Site Visit	1:00 p.m. Site visit at 1700 Cedar Avenue, Greeley Colorado
Inquiry Deadline	8/20/2024 – by 2:00 p.m. MST
Final Addendum Issued	8/26/2024
Bid Due Date and Time	9/05/2024 – By 2:00 p.m. MST via email to purchasing@greeleygov.com
Interviews	N/A
Notice of Award (tentative)	Week of 9/09/2024
Notice to Proceed (tentative)	Week of 9/16/2024

City of Greeley, Colorado
Purchasing Division

Greeley Website
August 9, 2024

Section 00120

BID PROPOSAL

PROJECT: F24-08-071 - Linn Grove Irrigation Wells -BID

The Undersigned, having become familiar with the local conditions affecting the cost of the work, plans, drawings, and specifications attached herewith, and with advertisement for bids, the form of bid and proposal, form of bond, all of which are issued and attached and on file in the office of the Project Manager, hereby bid and propose to furnish all the labor, materials, necessary tools, and equipment and all utility and transportation service necessary to perform and complete in a workmanlike manner all of the work required in connection with the construction of the items listed on the bidding schedule in accordance with the plans and specifications as prepared by the City of Greeley, Colorado, for the sums set forth in the Bidding Schedule.

The total bid shall be the basis for establishing the amount of the Performance and Payment Bond for this project. The total bid is based on the quantities shown in the bid proposal form and the dimensions shown on the plans.

The undersigned has carefully checked the Bidding Schedule quantities against the plans and specifications before preparing this proposal and accepts the said quantities as substantially correct, both as to classification and the amounts, and as correctly listing the complete work to be done in accordance with the plans and specifications.

The undersigned, agrees to complete and file a Performance and Payment Bond and further agrees to complete the contract within sixty (60) Calendar Days from Notice to Proceed. Official notice to proceed will not be issued until adequate Performance and Payment Bonds and other required documents are on file with the City of Greeley.

NOTE: Bidders should not add any conditions or qualifying statements to this bid as otherwise the bid may be declared irregular as being non responsive to the Invitation for bids. The following numbered Addenda have been received and the bid, as submitted, reflects any changes resulting from those Addenda: _____

ATTEST

DATE

COMPANY NAME

BY

SIGNATURE

TITLE

**SECTION 00130
 BID SCHEDULE
 F24-08-071 - Linn Grove Irrigation Wells -BID**

Drill and Complete Well D						
Item #	Description	Estimated Quantity	Unit	Unit Price (Written)	Unit Price (Numbers)	Total Price (Numbers)
02700-01	Production Well Drill and Complete Mobilization	1	L.S.			
02700-02	Furnish Bonds and Insurance	1	L.S.			
02800-01	Drill, Furnish, and Install 28-Inch Surface Casing	20	L.F.			
02800-02	Drill Production Well 24-Inch Borehole	47	L.F.			
02800-03	Furnish and Install 18-Inch Stainless Steel Screen	15	L.F.			
02800-04	Furnish and Install 18-Inch Blank PVC Casing	30	L.F.			
02800-05	Furnish and Install 18-Inch Blank Steel Casing	21	L.F.			
02800-06	Furnish and Install Gravel Pack	47	L.F.			
02800-07	Furnish and Install Grout	20	L.F.			
02800-08	Rig Time	2	Hr.			
02800-09	Standby Time	1	Hr.			
02810-01	Downhole Video	1	L.S.			
02820-01	Well Development	24	Hr.			
02830-01	Mobilize and Set Test Pump	1	L.S.			
02830-02	Conduct Aquifer Testing	34	Hr.			
02840-01	Disinfection	1	L.S.			
Drill and Complete Center South						
Item #	Description	Estimated Quantity	Unit	Unit Price (Written)	Unit Price (Numbers)	Total Price (Numbers)
02700-01	Production Well Drill and Complete Mobilization	1	L.S.			
02700-02	Furnish Bonds and Insurance	1	L.S.			
02800-10	Drill, Furnish, and Install 24-Inch Surface Casing	20	L.F.			
02800-11	Drill Production Well 20-Inch Borehole	37	L.F.			
02800-12	Furnish and Install 14-Inch Stainless Steel Screen	10	L.F.			
02800-13	Furnish and Install 14-Inch Blank PVC Casing	25	L.F.			
02800-14	Furnish and Install 14-Inch Blank Steel Casing	21	L.F.			
02800-15	Furnish and Install Gravel Pack	37	L.F.			
02800-16	Furnish and Install Grout	20	L.F.			
02800-17	Rig Time	2	Hr.			
02800-18	Standby Time	1	Hr.			
02800-19	Pull Existing Pumping Equipment and Abandon Well	1	L.S.			
02810-01	Downhole Video	1	L.S.			
02820-01	Well Development	24	Hr.			
02830-01	Mobilize and Set Test Pump	1	L.S.			
02830-02	Conduct Aquifer Testing	34	Hr.			
02840-01	Disinfection	1	L.S.			
Summary Total BID (Numbers)						
Summary Total BID (Written)						

All of the above items should be listed as bid items complete as lump sum or unit price bids. These shall be used by the Contractor for project billing according to progress. The Engineer will approve all Contractor-installed unit quantities prior to submittal of application for payment to the City.

1. Bids shall be furnished for all bid items. If a bid is furnished for less than all items listed, that bid will be rejected as nonresponsive.
2. The apparent low bid will be determined based on the Summary Total Bid.
3. Any and all bid items may be awarded as part of the Contract Award.
4. Measurement and units: L.S. = Lump Sum; L.F. = Linear Foot; Hr. = Hour; EA = Each. Description: See Section 01200.
5. Contractor's proposed drilling fluid/drilling method: _____
6. Contractor's proposed mobilization date pending approval/contracting with the City _____

Name of Company _____

Signature _____

COOPERATIVE PURCHASING STATEMENT

The City of Greeley encourages and participates in cooperative purchasing endeavors undertaken by or on behalf of other governmental jurisdictions. To the extent, other governmental jurisdictions are legally able to participate in cooperative purchasing endeavors; the City of Greeley supports such cooperative activities. Further, it is a specific requirement of this proposal or Request for Proposal that pricing offered herein to the City of Greeley may be offered by the vendor to any other governmental jurisdiction purchasing the same products. The vendor(s) must deal directly with any governmental agency concerning the placement of purchase orders, contractual disputes, invoicing, and payment. The City of Greeley shall not be liable for any costs or damages incurred by any other entity.

SECTION 00140

BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto the City of Greeley, Colorado, as Owner, in the penal sum of _____ for the Payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors, and assigns.

THE CONDITION of this obligation is such that whereas the Principal has submitted to the City of Greeley, Colorado, the accompanying bid and hereby made a part hereof to enter into a Contract Agreement for the construction of City of Greeley Project,

F24-08-071 - Linn Grove Irrigation Wells -BID

WHEREAS, the Owner, as condition for receiving said bid, requires that the Principal to deposit with the Owner as Bid Guaranty equal to five percent (5%) of the amount of said bid.

NOW, THEREFORE,

(a) If said bid shall be rejected; or in the alternate,

(b) If said bid shall be accepted and the Principal shall execute and deliver a Contract Agreement (properly completed in accordance with said bid) and shall furnish a Performance and Payment Bond upon the forms prescribed by the Owner for the faithful performance of said Agreement; and shall in all other respects perform the agreement created by the acceptance of said bid;

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

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

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals this _____ day of _____, 20_____, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL

SURETY

Name: _____

Address: _____

By: _____

Title: _____ Attorney _____

In-Fact:
(Seal)

(Seal)

NOTE: Surety Companies executing bonds must be authorized to transact business in the State of Colorado and be accepted to the Owner.

SECTION 00210

NOTICE OF AWARD

DATE:

TO:

Re: **F24-08-071 - Linn Grove Irrigation Wells -BID**

Dear Contractor:

The City of Greeley, Colorado (hereinafter called "the Owner") has considered the bids submitted for referenced work in response to its Invitation for Bids. You are hereby notified that your bid has been accepted for items and prices stated in the Bid Schedule in the amount of \$_____. You are required to execute the Contract Agreement, provide the necessary insurance certificates, the Performance and Payment Bonds within ten (10) days from the date of this Notice. If you fail to execute said Contract Agreement and furnish the necessary insurance certificates and bonds within the time allotted from this date, the Owner will be entitled to consider your rights arising out of the Owner's acceptance of your bid as abandoned and to demand payment of bid guaranty as damages. The Owner will be entitled to such other rights as may be granted by law. You are required to return an acknowledged copy of this Notice of Award and enclosures to Purchasing.

CITY OF GREELEY, COLORADO

By: Sean Chambers

Title: Director of Water & Sewer

ACKNOWLEDGMENT: Receipt of the foregoing Notice of Award accompanied with a Performance and Payment Bond form and a signed copy of the Contract Document is hereby acknowledged this _____ day of _____, 20_____.

Bidder: _____

By: _____

SECTION 00310

CONTRACT

THIS AGREEMENT made and entered into this _____ day of ____, 20__, by and between the City of Greeley, Colorado, and under the laws of the state of Colorado, party of the first part, termed in the Contract Documents as the "Owner" and party of the second part, termed in the Contract Documents as "Contractor."

WITNESSETH: In consideration of monetary compensation to be paid by the Owner to the Contractor at the time and in the manner hereinafter provided, the said Contractor has agreed, and does hereby agree, to furnish all labor, tools, equipment and material and to pay for all such items and to construct in every detail, to wit:

PROJECT: F24-08-071 - Linn Grove Irrigation Wells -BID

at the price bid on the Proposal Form of \$ _____ all to the satisfaction and under the general supervision of the Project Manager for the City of Greeley, Colorado.

The Contract Documents consist of this Agreement, the Conditions of the Contract (General, Supplementary and other Conditions), the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued after execution of this Agreement. These form the Contract, and all are as fully a part of the Contract as if attached to this Agreement or repeated herein.

The Project Manager named herein shall interpret and construe the Contract Documents, reconciling any apparent or alleged conflicts and inconsistencies therein; and all of the work and all details thereof shall be subject to the approval and determination of the Project Manager as to whether or not the work is in accordance with Contract Documents. Said City Project Manager shall be the final arbiter and shall determine any and all questions that may arise concerning the Contract Documents, the performance of the work, the workmanship, quality of materials and the acceptability of the completed project. The decision of the Project Manager on all questions shall be final, conclusive and binding.

AND FOR SAID CONSIDERATION IT IS FURTHER PARTICULARLY AGREED BETWEEN THE PARTIES TO THIS AGREEMENT.

1. That construction and installation of the above enumerated work for the Owner shall be completed and ready for use in accordance with the time of completion described in the Bid form of this Contract. The Owner reserves the right to void the contract if the work does not commence by the agreed upon schedule provided in the bid documents and/or executed contract.
2. That said work and materials for the project covered by the Contract Documents shall be completely installed and delivered to the Owner, within the time above stated, clear and free from any and all liens, claims, and demands of any kind.
3. The full compensation to be paid the Contractor by the Owner pursuant to the terms of this Contract shall be payable as provided in the Contract Documents.

4. This Contract consists of the following component parts, all of which are as fully a part of the Contract as herein set out verbatim, or if not attached, as if hereto attached:

- Section 00110: Invitation for Bid
- Section 00120: Bid Proposal
- Section 00130: Bid Schedule
- Section 00140: Bid Bond
- Section 00160: Pre-bid meeting
- Section 00210: Notice of Award
- Section 00310: Contract
- Section 00320: Performance Bond
- Section 00330: Payment Bond
- Section 00340: Certificate of Insurance
- Section 00350: Lien Waiver Release
- Section 00360: Debarment/Suspension Certification Statement
- Section 00410: Notice to Proceed
- Section 00420: Project Manager Notification
- Section 00430: Certificate of Substantial Completion
- Section 00440: Final Completion
- Section 00510: General Conditions of the Contract
- Section 00520: Subcontractors List
- Section 00620: Special Provisions

Addenda Number _____ Inclusive

Any modifications, including change orders, duly delivered after execution of this Agreement.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed as of the day and year first above written.

EXECUTED:

The City of Greeley
Approved as to Substance

Signed: _____
Name: _____
Title: _____
Date: _____

CONTRACTOR:

Signed: _____
Name: _____
Title: _____
Date: _____

ENDORSED:

The City of Greeley
Approved as to Legal Form

Signed: _____
Name: _____
Title: _____
Date: _____

ENDORSED:

The City of Greeley
Certification of Contract Funds Availability

Signed: _____
Name: _____
Title: _____
Date: _____

SECTION 00320

PERFORMANCE BOND

Bond No. _____

KNOWN ALL MEN BY THESE PRESENTS: that

(Firm) _____

(Address) _____

(an Individual), (a Partnership), (a Corporation), hereinafter referred to as "the Principal", and

(Firm) _____

(Address) _____

hereinafter referred to as "the Surety", are held and firmly bound unto the CITY OF GREELEY, 1000 10th Street, Greeley, CO. 80631, a Municipal Corporation, hereinafter referred to as "the Owner" in the penal sum of _____ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these present.

THE CONDITIONS OF THIS OBLIGATION are such that whereas the Principal entered into a certain Contract Agreement with the Owner, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for the performance of City of Greeley Project,

F24-08-071 - Linn Grove Irrigation Wells -BID

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract Agreement during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without Notice to the Surety and during the life of the guaranty period, and if he shall satisfy all claims and demands incurred under such Contract Agreement, and shall fully indemnify and save harmless the Owner from all cost and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, and then this obligation shall be void; otherwise to remain in full force and effect.

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

IN WITNESS WHEREOF, this instrument is executed this _____ day of _____, 20____.

PROVIDED, FURTHER, that no final settlement between the Owner and Contractor shall abridge the right of any beneficiary hereunder, whose claims may be unsatisfied.

IN PRESENCE OF:

PRINCIPAL

_____ By: _____

_____ (Corporate Seal)

_____ (Address)

IN PRESENCE OF:

OTHER PARTNERS

_____ By: _____

_____ By: _____

By: _____

IN PRESENCE OF:

SURETY

_____ By: _____

_____ (Attorney-in-Fact)

_____ (SURETY SEAL)

_____ (Address)

NOTE: Date of Bond must not be prior to date of Contract Agreement. If Contractor is Partnership, all partners should execute bond.

IMPORTANT: Surety Company must be authorized to transact business in the State of Colorado and be acceptable to the Owner.

SECTION 00330

PAYMENT BOND

Bond No. _____

KNOWN ALL MEN BY THESE PRESENT: that

(Firm) _____

(Address) _____

(an Individual), (a Partnership), (a Corporation), hereinafter referred to as "the Principal", and

(Firm) _____

(Address) _____

hereinafter referred to as "the Surety", are held and firmly bound unto the CITY OF GREELEY, 1000 10th Street, Greeley, Co. 80631, a Municipal Corporation, hereinafter referred to as "the Owner", in the penal sum of

_____ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION are such that whereas the Principal entered into a certain Contract Agreement with the Owner, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for the performance of

F24-08-071 - Linn Grove Irrigation Wells -BID

NOW, THEREFORE, if the Principal shall make payment to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract Agreement, and any equipment and tools, consumed, rented or used in connection with the construction of such work and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

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

IN WITNESS WHEREOF, this instrument is executed this _____ day of _____, 20____.

PROVIDED, FURTHER, that no final settlement between the Owner and Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN PRESENCE OF:

PRINCIPAL

_____ By: _____

(Corporate Seal)

(Address)

IN PRESENCE OF:

OTHER PARTNERS

_____ By: _____

_____ By: _____

_____ By: _____

IN PRESENCE OF:

SURETY

_____ By: _____

(Attorney-in-Fact)

(SURETY SEAL)

(Address)

NOTE: Date of bond must not be prior to date of Contract Agreement. If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety Company must be authorized to transact business in the State of Colorado and be acceptable to the Owner.

SECTION 00350

LIEN WAIVER RELEASE

TO: City of Greeley, Colorado (hereinafter referred to as "the OWNER".)

FROM: (hereinafter referred to as "the CONTRACTOR")

PROJECT: **F24-08-071 - Linn Grove Irrigation Wells -BID**

1. The CONTRACTOR does hereby release all Mechanic's Liens Rights, Miller Act Claim (40 USCA 270), Stop Notice, Equitable Liens and Labor and Material Bond Rights resulting from labor and/or materials, subcontract work, equipment or other work, rents, services or supplies heretofore furnished in and for the construction, design, improvement, alteration, additions to or repair of the above described project.
2. This release is given for and in consideration of the sum of \$ and other good and valuable consideration. If no dollar consideration is herein recited, it is acknowledged that other adequate consideration has been received by the CONTRACTOR for this release.
3. In further consideration of the payment made or to be made as above set forth, and to induce the OWNER to make said payment, the CONTRACTOR agrees to defend and hold harmless the OWNER, employees, agents and assigns from any claim or claims hereinafter made by the CONTRACTOR and/or its material suppliers, subcontractors or employees, servants, agents or assigns of such persons against the project. The CONTRACTOR agrees to indemnify or reimburse all persons so relying upon this release for any and all sums, including attorney's fees and costs, which may be incurred as the result of any such claims.
4. It is acknowledged that the designation of the above project constitutes an adequate description of the property and improvements for which the CONTRACTOR has received consideration for this release.
5. It is further warranted and represented that all such claims against the CONTRACTOR or the CONTRACTOR's subcontractors and/or material suppliers have been paid or that arrangements, satisfactory to the OWNER and CONTRACTOR, have been made for such payments.
6. It is acknowledged that this release is for the benefit of and may be relied upon by the OWNER, the CONTRACTOR, and construction lender and the principal and surety on any labor and material bond for the project.

SECTION 00360

Debarment/Suspension Certification Statement

The proposer certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal, State, County, Municipal or any other department or agency thereof. The proposer certifies that it will provide immediate written notice to the City if at any time the proposer learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstance.

DUNS # (Optional) _____

Name of Organization _____

Address _____

Authorized Signature _____

Title _____

Date _____

SECTION 00410

NOTICE TO PROCEED

Month , 20

TO: NAME

PROJECT: **F24-08-071 - Linn Grove Irrigation Wells -BID**

To Whom It May Concern:

You are hereby notified to commence work on the above-referenced project in accordance with the Contract Agreement dated Month , 20 .

You are to complete this project by Month , 20

CITY OF GREELEY, COLORADO

By: _____

Title: _____

Signature

SECTION 00420

PROJECT MANAGER NOTIFICATION

DATE: _____

TO:

PROJECT: **F24-08-071 - Linn Grove Irrigation Wells -BID**

The Owner hereby designates Ryan Duve as its Project Manager and authorizes this individual, under the authority of the Director of Water & Sewer to make all necessary and proper decisions with reference to the project. Contract interpretations, change orders and other requests for clarification or instruction shall be directed to the Project Manager. The Director of Public Works shall be authorized to bind the Owner with respect to any decision made in accordance with the contract document.

CITY OF GREELEY, COLORADO

By: _____

Title: _____

SECTION 00430

CERTIFICATE OF SUBSTANTIAL COMPLETION

TO: CONTRACTOR

PROJECT: F24-08-071 - Linn Grove Irrigation Wells -BID

Project or designated portion shall include: Describe Scope.

The work performed under this contract has been reviewed and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby established as Month , 20 .

The date of commencement of applicable warranties required by the Contract Documents is stipulated in Section 00440 - Certificate of Final Acceptance.

DEFINITION OF DATE OF SUBSTANTIAL COMPLETION

The Date of Substantial Completion of the Work or designated portion thereof is the date certified by the Project Manager when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

A list of items to be completed or corrected, prepared by the Contractor and verified and amended by the Project Manager is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The date of commencement of warranties for items on the attached list is as stipulated in Section 00440 – Certificate of Final Acceptance.

The Owner shall operate and maintain the Work or portion of the Work described above from the Date of Substantial Completion and be responsible for all costs associated with the completed work excluding cost related to warrantee work.

The Contractor will complete or correct the Work on the list of items attached hereto within days from the above Date of Substantial Completion.

Contractor

Owner

(Note--Owner's and Contractor's legal and insurance counsel should review and determine insurance requirements and coverage; Contractor shall secure consent of surety company, if any.)

SECTION 00440

CERTIFICATE OF FINAL ACCEPTANCE

TO: **CONTRACTOR**

PROJECT NAME: **F24-08-071 - Linn Grove Irrigation Wells -BID**

The work performed under this contract has been reviewed and found to meet the definition of final acceptance. This Certificate of Final Acceptance applies to the whole of the work.

The Date of Final Acceptance of the Project designated above is hereby established as: Month _____, 20____ at 2:00 pm. This date is also the date of commencement of applicable warranties associated with the Project described above and as required by the Contract Documents.

DEFINITION OF DATE OF FINAL ACCEPTANCE

The Date of Final Acceptance of the Work is the date certified by the City of Greeley's Project Manager when the work is 100% complete, in accordance with the Contract Documents, as amended by change order(s), or as amended below:

Amendment to the Certificate of Final Completion (if any): Describe Amendments.

The Contractor and/or the City Of Greeley shall define any claims or requests for additional compensation above (or as attachments to this document).

Final Acceptance shall not be achieved until the Contractor provides the City Of Greeley with all contract specified Contractor and Sub-contractor close out documents including final lien waivers, releases, insurances, manuals, training, test results, warranties, and other documents required by the Contract Documents, as amended.

Upon issuance of the Certificate of Final Acceptance the Contractor may submit an application for payment requesting final payment for the entire Work. Liquidated damages (if any) will be assessed at this time.

Contractor's acceptance of the final payment shall constitute a waiver by the Contractor of all claims arising out of or relating to the Work; except as noted under 'Amendment to the Certificate of Final Acceptance' above.

Agreed:

_____	_____20	_____	_____20
Contractor's Representative	DATE	Project Manager (COG)	DATE

SECTION 00510

**CITY OF GREELEY
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
(REVISED MAY 2020)**

Please click the link below to access the Section 00510 General Conditions.

[SECTION 00510 General Conditions_BID #F24-08-071.pdf](#)



SECTION 520
SUBCONTRACTORS/MATERIALS SUPPLIERS AND RELATED DATA

Firm Name: _____ City Contractors License # _____
Primary Contractor _____
PROJECT: _____ Address: _____

For each Subcontractor and/or Materials Suppliers to be utilized, please provide the following information (use additional sheets as necessary):

Phone Number: _____ Fax Number: _____
Proposed work and percentage of total work to be assigned _____
Percentage: _____ %

Firm Name: _____ City Contractors License # _____
Address: _____
Phone Number: _____ Fax Number: _____
Proposed work and percentage of total work to be assigned _____
Percentage: _____ %

Firm Name: _____ City Contractors License # _____
Address: _____
Phone Number: _____ Fax Number: _____
Proposed work and percentage of total work to be assigned _____
Percentage: _____ %

Firm Name: _____ City Contractors License # _____
Address: _____
Phone Number: _____ Fax Number: _____
Proposed work and percentage of total work to be assigned _____
Percentage: _____ %

Firm Name: _____ City Contractors License # _____
Address: _____
Phone Number: _____ Fax Number: _____
Proposed work and percentage of total work to be assigned _____
Percentage: _____ %

If the Primary Contractor adds any Subcontractors or Materials Suppliers during the duration of the project, the Primary Contractor will supply the City with an updated form before the Subcontractor or Materials Supplier will be allowed to work on the project.

SECTION 00620
SPECIAL PROVISIONS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

This Work consists of the drilling, construction, development, and aquifer testing of two irrigation wells at the Linn Grove Cemetery located at 1700 Cedar Avenue in the City of Greeley, Colorado. All equipment, materials, including bits shall be clean, and disinfected prior to access to the site. The Contractor shall also be responsible for furnishing all labor and materials required to drill, construct, develop, and test the wells as set forth in the Bid Schedule.

1.02 CONSTRUCTION DRAWINGS

The City's Design Engineer, Stantec, prepared the included project figures, which include location maps and well designs. The figures are part of these contract documents and are located within the appendices of the Project Manual.

1.03 SPECIFICATIONS

This project is subject to the following specifications:

- A. Project Manual
- B. Colorado State Engineer's Office (SEO) Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction
- C. American Water Works Association Standard for Water Wells, AWWA A100-06
- D. Manual of Water Well Construction Practice, EPA-570/9-75-001
- E. Latest edition of any of the above

1.04 PRIORITY OF DOCUMENTS

In case of conflict, documents shall have the following priorities:

- A. Section 00620 - Special Provisions
- B. General Conditions
- C. Figures (Appendices)
- D. Project Specifications
- E. The more stringent of City of Greeley or SEO specifications listed above

1.05 PRE-CONSTRUCTION CONFERENCE

After the Contract award and prior to commencing work, the Contractor shall attend a pre-construction conference. The Contractor shall have the following information available:

- A. Bar graph of construction schedule with periodic updates as required by changes in schedule
- B. Traffic control plans, as needed
- C. City of Greeley permits and an appropriate discharge permit for development and aquifer testing
- D. Well testing and development water discharge plan, as needed
- E. Plan for protecting nearby structures and/or landscape
- F. Plan for protecting existing water lines and utilities
- G. Subcontractors, as applicable
- H. Certificates of insurance

1.06 PERMITS

The Contractor shall obtain necessary City of Greeley permits. The Contractor is required to obtain the following permits: an appropriate NPDES permit, and a City Right of Way permit. The City will waive all permit fees.

1.07 RIGHT-OF-WAY

Right-of-way has not been staked, but the drill site and improvements are all located on City property at the Linn Grove Cemetery. No work is required outside of City owned property. The Contractor shall limit operations to each respective drill site, and a staging area agreed to with the City. The Contractor shall not place materials, operate equipment, drive across or otherwise trespass on private property outside of the cemetery without the express permission of the respective property owner.

1.08 WORK HOURS

The Contractor shall restrict working hours to between 7:00 a.m. and 7:00 p.m. on normal City of Greeley business (working) days unless prior approval has been obtained from the City. Events at the Linn Grove Cemetery may affect the dates and times that work can be completed. Any work outside of these hours will require the approval of City cemetery personnel. The Contractor shall, during all work periods, provide an adequate crew of suitably qualified personnel to prevent unnecessary delays in project completion. The Contractor will be required to provide 24-hour per day maintenance of pumping and monitoring equipment during test pumping. The test pumping schedule must be pre-approved by the City.

1.09 SUBMITTALS

The Contractor shall submit manufacturers' information and certification that all materials conform to materials specifications in accordance with Section 01010 of these specifications. Engineer will review all construction submittals and return comments within 10 days of receipt of the submittal.

1.10 TRAFFIC CONTROL

The Contractor shall provide traffic control plans as needed for the project and submit those to the City of Greeley for review/acceptance.

1.11 PROTECTION OF EXISTING UTILITIES

The Contractor shall be responsible for the protection of all existing utilities and improvements. Before proceeding with construction, the Contractor shall notify all utility companies of the pending construction, and request field marking of utility locations. Notification of the pending construction shall also be given to the owners of other improvements as appropriate. The Contractor shall request the location and field marking of other improvements as necessary. The Contractor shall request locations of underground utilities and other interferences at least two business days in advance of below grade disturbances.

The Contractor shall work closely with all utility companies to avoid disturbing existing utilities.

The City of Greeley will not be responsible for any construction down time due to the Contractor's failure to notify utility companies of conflicts. The Contractor shall notify the City and the Engineer of any potential conflicts.

1.12 ADJACENT IMPROVEMENTS

The Contractor shall be responsible to protect existing structures, improvements, irrigation lines, and landscaping near the drill sites from damage. Any damage to existing improvements and/or structures shall be restored by the Contractor to their original condition or better at no cost to the City.

1.13 POST CONSTRUCTION INSPECTION AND WARRANTY

The Contractor shall provide a **two-year** warranty for all construction from date of substantial completion.

Prior to expiration of two years from date of substantial completion, representatives of the City will make a visual inspection of the project to determine where correction work is required. The Contractor shall attend such inspection.

1.14 GENERAL CONDITIONS

A. DEFINITIONS

1. ABILITY – that which a person can do on the basis of present development and training.
2. OWNER – shall mean the City of Greeley.
3. DATE OF FINAL ACCEPTANCE – Refer to Section 00440 Certificate of Final Acceptance.
4. DATE OF SUBSTANTIAL COMPLETION – Refer to Section 00430 Certificate of Substantial Completion.
5. CITY – The City of Greeley.

6. **COMPETENT** – A person who has the natural powers, physical or mental, to meet the demands of a situation or work; the word is widely used to describe the ability to meet all requirements, natural, legal, or other of a given task.
7. **CONSTRUCTION DRAWINGS** – Detailed and working drawings, including plan, profile, and detail sheets of proposed utility improvements, approved by the Engineer.
8. **CONSULTANT** – The partnership, corporation, or individual who is a Registered Professional Engineer in the State of Colorado hired by the City and is empowered to act as his agent for the project.
9. **CONTRACTOR** – The corporation, association, partnership, or individual who has entered into an Agreement with the City to perform the work, and who is licensed and bonded in the City of Greeley in accordance with the requirements of the City Code, for public right-of-way work.
10. **DAYS** – Intended as calendar days, not normal working days, unless stipulated as working days.
11. **DESIGN ENGINEER** – The partnership, corporation, or individual who is registered as a professional engineer, according to Colorado statutes, and who is hired by the City, and is empowered to act as his agent for the project.
12. **ENGINEER** – A term used in situations where a decision or action may be required by the City Engineer with the City of Greeley or his agent.
13. **MAY** – A permissive condition. No requirement for design or application is intended.
14. **NORMAL WORKING DAYS** – Monday through Friday. Saturdays, Sundays, and legal Holidays shall not be considered normal working days.
15. **OR AN APPROVED EQUAL** – As approved to being acceptable by the Engineer.
16. **PROJECT AS BUILT RECORD DRAWINGS** – Detailed drawings which have been prepared by the Design Engineer, upon completion and at the time of the certificate of substantial completion, and show actual construction and contain field dimensions, elevations, details, changes made to the construction drawings by modification, details which were not included on the construction drawings, and horizontal and vertical locations of underground utilities which have been impacted by the utility installation.
17. **PROJECT REPRESENTATIVE** – Shall mean an authorized representative of the Engineer assigned to complete project observation and review for contract performances, standards, and contract compliance.
18. **PROVIDE** – Furnish and install complete in place.
19. **QUALIFIED** – Acquired abilities: skill, knowledge, experience, that fits a person for a position, office, or profession.
20. **REMOVE** – Remove and dispose of legally.

21. ACCEPTANCE TESTING – Shall mean test that will be performed by the City of Greeley Public Works Department or its authorized representative. Acceptance tests shall include but not be limited to the following: CONCRETE - slump, compressive strength, air content, and aggregate sieve analysis tests, SOILS - moisture density relationship and density tests, AGGREGATE BASE COURSE - moisture-density relationship and density tests, HOT BITUMINOUS PAVEMENT tests.
22. SHALL – A mandatory condition.
23. SHOULD – An advisory condition. Where the word "should" is used, it is considered to be advisable usage, but not mandatory. Deviations may be allowed when reasons are given which show that the intent of the standard is met.
24. UTILITIES – Shall mean all utilities on site prior to the time of any design; such as but not limited to water lines, sanitary sewer lines, drainage lines, electric lines, gas lines, telephone lines, and cable television lines.
25. WORK – The entire completed construction or the various separately identifiable parts required to be furnished for the project. Work is the result of performing services, furnishing the labor and furnishing and incorporating materials and equipment into the construction.
26. WORKING DAYS – Any day, exclusive of Saturdays, Sundays, and holidays, on which weather and other conditions not under the control of the Contractor will permit construction operations to proceed with the normal working force engaged in performing those items controlling the completion of the work.
27. WORKING HOURS – The Contractor shall restrict working hours to between 7:00 a.m. and 7:00 p.m. on normal City of Greeley business days unless prior approval has been obtained from the City Engineer.

B. ABBREVIATIONS

1. ACI – American Concrete Institute
2. APWA – American Public Works Association
3. ASTM – American Society for Testing and Materials
4. AWG – American Wire Gauge
5. AWS – American Welding Society
6. AWWA – American Water Works Association
7. EPA – United States Environmental Protection Agency
8. ITE – Institute of Transportation Engineers
9. ISSA – International Slurry Seal Association
10. MGPEC – Metropolitan Governments Pavement Engineers Council
11. OSHA – Occupational Safety and Health Administration

END OF SECTION

TECHNICAL SPECIFICATIONS

**CITY OF GREELEY
LINN GROVE
IRRIGATION WELLS PROJECT**

BID NO. F24-08-071

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DIVISION 01

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF SERVICES FURNISHED

- A. The Contractor shall furnish all materials, equipment, plant, labor, tools, supplies, transportation, and appurtenances for the drilling, construction, development, and aquifer testing of two new irrigation water supply wells, Center South and Well D, to be completed as specified in these Contract Documents. The locations of these wells are shown on Figure 1 in Appendix A. All equipment, materials, including bits shall be cleaned and disinfected prior to access to the sites.
- B. The Contractor shall be responsible for the performance of all labor, work, or other operations required for the fulfillment of the Contract in strict accordance with the specifications, figures, and other Contract Documents as herein before defined, all of which are made a part hereof, and including such detail sketches as may be furnished by the Engineer from time to time during construction in explanation of said Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary for the complete and proper construction of the work in good faith shall be performed, furnished, and installed by the Contractor as though originally so specified or shown, at no increase in cost to the City.
- C. Approximate depths of drilling and quantities of well completion materials are provided in Section 00130 (Bid Schedule) and shall be used for the purposes of price estimation and determining the apparent low bidder. Exact depths and lengths will be determined by the Engineer during the course of construction using geologic logs of the boreholes.

1.02 SERVICES FURNISHED BY THE CITY

The City will provide land and rights-of-way for the work specified in this Contract. The Contractor may use a City owned fire hydrant for the purpose of drilling the Center South Well. The nearest fire hydrant to Center South Well is 530 feet to the west. An irrigation system hydrant that is approximately 350 feet from Well D may be used for drilling water supply during the construction of that well. The locations of these drilling water supply sources are shown on the figures in Appendix B.

With the exception of those required by the City, the City will supply the required permits for well construction. Provisions and Conditions for access to the project site will be provided by the City. The Contractor shall not enter on or occupy with laborers, tools, equipment, or material any ground outside the property and rights-of-way provided by the City unless stated otherwise by the City. Other contractors, employees, or agents of the City/Engineer may enter the project site and premises used by the Contractor for business purposes only.

1.03 SERVICES FURNISHED BY THE ENGINEER

The Engineer will provide relevant geologic and/or hydrogeologic information to the Contractor, identify the location of the selected production well sites, assist in the evaluation of drilling characteristics, examine drill cuttings and determine geologic

formation, determine final drill depths, provide the Contractor with final production well designs for placement of well casing, screen, annular materials, and cement seals, observe well construction, evaluate well development activities, and assist in completion of stepped and constant rate aquifer testing. The Engineer will provide consultation and direction regarding unforeseen conditions, and administer the Contract.

1.04 DRILL SITES

- A. As shown on Figure 1 in Appendix A, an existing irrigation well, Center South, is located near the intersection of East 18th Street and Cherry Ave within the Linn Grove Cemetery in East Greeley within Weld County, Colorado. The original well shall be plugged and abandoned as part of this Contract. The replacement well for Center South will be located near the original water supply well and an existing monitoring well, MW-CS, that is located east of the original Center South well. A new well will be constructed at Well D. The location of Well D is also shown in Figure 1 in Appendix A, in the southeast corner of the Linn Grove Cemetery along East 18th Street. The drill sites are located on land owned by the City of Greeley.
- B. The well sites can be accessed via existing state and city roads. It is anticipated that the drill site can be accessed via existing roads such that no earth work will be required to provide access. No site grading is anticipated to prepare for the drill rig.
- C. The Center South Well Site has a limited area for drilling. The site has historic trees on the east side, graves on the west side, and East 18th Street to the south. All of these features must remain protected and undisturbed. The City's Arborist will require ground protection mats if the drilling rig is mobilized from the north to minimize compaction of soil and tree roots. A chain link fence will need to be removed and replaced if the drilling rig is mobilized from the south (E 18th Street). Drilling operations will be confined to the limits of construction that will be defined during the pre-bid meeting.
- D. The Well D Site is in an easy-to-access open field that is not limited by trees and infrastructure.
- E. The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices.

1.05 DESCRIPTION OF WORK

The work to be performed under this Contract is summarized below and is discussed in further detail in subsequent sections of the Contract Documents. Conceptual well designs for Center South and Well D are included in Appendix C. Borehole logs of MW-CS and TH-4 are included in Appendix D.

- A. Well Completion Work:
 - 1. Mobilize to and demobilize from the production well sites, including any requisite site restoration. Disinfection of all drilling equipment will be required prior to mobilization. Disinfection of equipment will be part of mobilization. Any required maintenance of roads shall be included under

mobilization/demobilization. Portable mud tanks shall be part of mobilization.

2. Drill, furnish, and install surface casing to stabilize the upper borehole and facilitate drilling of the alluvial aquifer at both locations.
3. Drill one production borehole through the alluvium at both Center South and Well D to a depth determined by the Engineer.
4. Furnish and install Engineer-specified lengths of stainless steel well screen, PVC blank casing, and Schedule 40 blank steel casing with centralizers into the boreholes.
5. Furnish and install gravel pack and cement grout into the annular space around the production wells at intervals determined by the Engineer.
6. Allow for standby time for delays specifically directed by the Engineer.
7. Allow rig time for well development, lost circulation – as defined and authorized in writing by the Engineer – and miscellaneous activities not specified in these Contract Documents that are requested in writing by the Engineer.
8. Develop the wells through various techniques including, but not limited to, the addition of chemical dispersing agents, and pumping, water jetting, and double surge block or a combination of these techniques.
9. Obtain a video log of the completed production wells.
10. Furnish, install, and remove a test pump and appurtenances for aquifer testing on the wells. Aquifer testing will consist of stepped and constant rate tests. Total aquifer testing time will last no longer than 34 hours per well.
11. Disinfect the completed production wells.
12. Restore the drill sites to their previous condition.

1.06 DRILLING CONDITIONS

- A. Drilling conditions at the site are typical of those associated with sand and gravel alluvial aquifers and shallow bedrock. As noted on the test hole or monitoring well completion reports for TH-4 and Center South contained in Appendix D, the sands and gravel are interbedded with silt and clay beds. Iron bacteria are present in this aquifer and the Contractor will be expected to employ measures, methods, or procedures that will not exacerbate their presence or transfer from site to site. The Contractor will also be expected to complete these wells in the upper portion of the underlying bedrock and be prepared to complete the boreholes accordingly.
- B. It is the Contractor's responsibility to become informed about local conditions affecting this work. Neither the information contained in these specifications, nor gleaned from the City, Engineer, or others, shall act to relieve the Contractor from any responsibility set forth in the Contract.

- C. The wells will be completed within the Linn Grove Cemetery. The Contractor and his crew are expected to maintain a clean site at all times, be respectful, and meet all local requirements. The drill site for Center South is located in close proximity to existing graves and highly prized-historical trees. The Contractor will take all measures necessary to avoid disturbing any existing graves and trees. Funerals are routinely held at the Linn Grove Cemetery project site. The work related to this project may require scheduling around these events to the extent possible. All work shall be located within the limits of construction.

1.07 WATER AND POWER

- A. The Contractor may obtain water for use during construction from a City of Greeley fire hydrant. A hydrant meter will be provided by the City to the Contractor for a \$2,000 deposit, which will be returned if the meter is returned in good condition. The City requires that the Contractor provide their own certified backflow device. The Contractor must submit a complete and executed copy of the Hydrant Meter Lease Agreement and a current backflow prevention test certificate for the backflow device through the City's eTrakit system to reserve the hydrant meter and pay the deposit with a credit card. The hydrant meter can be picked up at 1300 A Street, Building L, Greeley, CO 80631. The locations of the drilling water supply hydrants are included on the figures in Appendix B.
- B. The Contractor shall provide all necessary transportation, equipment and conveyance to provide for the quantity and quality of water required to complete the project. Costs for water conveyance facilities, temporary storage reservoirs, or transportation to the Work site from the fire hydrant shall be borne by the Contractor. This includes all necessary piping and components, but only at such locations and in a manner approved by the Engineer. Before final acceptance of the well, all temporary connections and piping installed by the Contractor shall be removed in a manner satisfactory to the City.
- C. The Contractor shall provide at his own expense all temporary power required for his operations under the Contract.

1.08 CONTRACTOR SUBMITTALS

The Contractor shall define his approach to the Work by submittal of the following items prior to commencement of the Work:

- A. The Contractor shall provide a work schedule, including working hours, within 7 days of receiving Notice of Award. The schedule for each crew or rig will provide detailed sequences of the Work. The City will negotiate the start date and Notice to Proceed with the Contractor. Mobilization of equipment and materials to the site shall constitute the beginning of work. All work by the Contractor shall be completed within 60 days after receipt of the Notice to Proceed.
- B. Drill rig specifications, drilling methods for the irrigation wells, drill bits and drilling assembly, drilling fluids, drilling fluid additives, permits, and lost circulation materials to be used. The Contractor shall use above ground tanks to facilitate drilling fluid circulation and containment. Excavated pits will not be allowed. 100 percent drilling fluid containment will be required.

- C. Material data on blank steel casing, stainless steel well screen, PVC blank casing, gravel pack, cement grout mix designs and cement type, and centralizers.
- D. Chemical dispersing agents, development tools and method, and a sketch of the downhole development tooling assembly.
- E. Test pump specifications and pump curve; column pipe diameters; a sketch of downhole pumping assembly and appurtenances with dimensions; a sketch of discharge manifold equipment, dimensions, and configuration; sand tester specs; flowmeter specs and calibration records; pressure gage info; sampling ports; and gate valve.
- F. ANSI/NSF Standards 60 and 61 Certifications.

1.09 SANITATION

The Contractor shall provide a chemical toilet at the project site. Toilets shall conform to applicable state and federal requirements. The cost of these sanitary facilities shall be borne by the Contractor.

1.10 CONTRACT METHOD

- A. The work hereunder will be paid for based on the unit prices as indicated in the bid schedule.
- B. The Contractor shall include the General Conditions and the Supplementary Conditions of the Contract as a part of all its subcontract agreements.

PART 2 MATERIALS & PRODUCTS

2.01 GENERAL

All substances introduced into the well during construction, development, or aquifer testing shall be certified to comply with ANSI/NSF Standard 60. All well materials and products must comply with ANSI/NSF Standard 61. This requirement applies to casing, drop pipe, coatings, sealants, solders, lubricants, cable, and all other equipment and surfaces.

PART 3 EXECUTION

Not Used

END OF SECTION 01010

SECTION 01200

MEASUREMENT AND PAYMENT

PART 1: MEASUREMENT AND PAYMENT

1.01 SCOPE (re. Section 01010)

- A. Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA) and Colorado Occupational Health and Safety Department (COHS). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs, therefore, shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.
- B. The quantities of work or material stated in unit price items of the Bid are supplied only to give an indication of the general scope of the work; the City does not expressly or by implication agree that the actual amount of work or material will correspond therewith, and reserves the right after award to increase or decrease the quantity of any unit price item of the work by an amount up to and including 30 percent of that Bid item, without a change in the unit price, and shall include the right to delete any Bid item in its entirety. Payment for materials and labor will be based on actual quantities furnished, installed, or constructed in accordance with the prices bid for unit price items. Lump sum items will not change to reflect actual quantities or services rendered unless those items are completely deleted from the project. There will be no payment for lost tools or materials which are improperly installed or materials which are rejected by the Engineer as faulty, broken or fail to meet specifications.
- C. The City may terminate work on the project at any point if the City's best interests are not served by continuation. In such an event, the Contractor shall be paid for the value of work completed at that time on the basis of the Total Bid Price, modified in accordance with the unit price and lump sum items listed on the Bid Schedule.

1.02 MOBILIZATION (re. 02700)

Payment for mobilization will be approved in accordance with the following schedule. Mobilization or any part thereof will be approved for payment under the contract when the majority of mobilization items have been completed as specified. Demobilization shall be incidental to mobilization and will be paid according to the following schedule when final site restoration is approved by the Engineer.

- A. Production Well Drilling Mobilization. Mobilization shall be 75 percent of the mobilization payment. Demobilization shall be 25 percent of the mobilization payment. Mobilization shall include that required for production well drilling and

construction. Incidentals such as equipment preparation and disinfection, site safety and security, removal and proper disposal of all excess drilling fluids, debris, and other materials used during drilling, filling, compacting, and grading of holes created during drilling, and miscellaneous materials and supplies shall be included in mobilization. Site restoration is included in the mobilization/demobilization cost.

- B. Furnish Bonds and Insurance. The Contractor shall provide all bonds and insurance as requested in these Contract Documents.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
02700-01	Production Well Drilling Mobilization	lump sum
02700-02	Bonds and Insurance	lump sum

1.03 WELL D PRODUCTION WELL DRILLING AND CONSTRUCTION (re. Section 02800)

Payment for production well drilling and construction will be approved in accordance with the following schedule.

- A. Drill, Furnish, and Install 28-Inch Surface Casing. Measurement and payment for the drilling, installation, cementing, and backfilling of the surface casing shall be based on the linear footage emplaced in the production well. Payment for the casing shall serve as full compensation for the casing, centralizers, cement, fill, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- B. Drill Production Well 24-Inch Borehole. Measurement and payment for drilling the borehole in accordance with these Contract Documents shall be based upon the linear footage actually drilled. All drilling will be measured on an in-place completed linear foot basis as called on the Bid Schedule. Payment for drilling shall be full compensation for rig, fuel, air compressors, mud pumps, bits, labor, drilling fluids, and incidentals necessary to complete the hole in accordance with these Contract Documents. The respective unit price will compensate the Contractor for all bits used and wear and tear on equipment, regardless of borehole diameter.
- C. Furnish and Install 18-Inch Pipe Size Stainless Steel Screen. Measurement and payment for the screen shall be based on the linear footage emplaced in the production well. Payment for the screen shall serve as full compensation for the screen, bottom plate, centralizers, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- D. Furnish and Install 18-Inch Blank PVC Casing. Measurement and payment for the casing shall be based on the linear footage emplaced in the production well. Payment for the casing shall serve as full compensation for the casing, centralizers, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.

- E. Furnish and Install 18-Inch Blank Steel Casing. Measurement and payment for the casing shall be based on the linear footage emplaced in the production well. Payment for the casing shall serve as full compensation for the casing, centralizers, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- F. Furnish and Install Gravel Pack. Measurement and payment for furnishing and installing the gravel pack will be based on the linear footage of material emplaced in the annular space, all in accordance with these Contract Documents. Payment for the gravel at the unit price listed on the Bid Schedule shall constitute full compensation for furnishing all tools, rigs, equipment, tremie pipes, labor, materials, and incidentals necessary to gravel pack the well in accordance with these Contract Documents.
- G. Furnish and Install Grout. Measurement and payment for furnishing and installing the cement grout will be based on linear footage emplaced in the annular space, all in accordance with these Contract Documents. Payment for the grout at the unit price listed on the Bid Schedule shall constitute full compensation for furnishing all tools, rigs, equipment, tremie pipes, labor, materials, cement and incidentals necessary to cement the well at the specified site in accordance with these Contract Documents. The Contractor shall allow for 10 percent overrun in materials to compensate for any washouts in the borehole.
- H. Rig Time. Measurement for rig time will be measured and compensated by the hour. Payment shall be full compensation for rig, fuel, air compressors, labor, drill bits, and incidentals necessary to perform the work. Rig time shall be paid only when authorized in writing by the Engineer.
- I. Standby Time. Standby time shall be the time when the drill rig is shut down, although in readiness to begin or resume operations, while the Contractor is waiting on orders of the Engineer or on materials or services or other items to be furnished by the Engineer. The Contractor shall be reimbursed for standby time at the unit-price-per-hour bid. Standby time shall not include such items as waiting for cement to cure, flow testing, or delivery of materials to site, among other items. Standby shall be paid only when authorized in writing by the Engineer.

ITEM	DESCRIPTION	UNIT
02800-01	Drill, Furnish, and Install 28-Inch Surface Casing	linear foot
02800-02	Drill Production Well 24-Inch Borehole	linear foot
02800-03	Furnish and Install 18-Inch Stainless Steel Screen	linear foot
02800-04	Furnish and Install 18-Inch Blank PVC Casing	linear foot
02800-05	Furnish and Install 18-Inch Blank Steel Casing	linear foot
02800-06	Furnish and Install Gravel Pack	linear foot
02800-07	Furnish and Install Grout	linear foot
02800-08	Rig Time	hour
02800-09	Standby Time	hour

1.04 CENTER SOUTH PRODUCTION WELL DRILLING AND CONSTRUCTION
(re. Section 02800)

Payment for production well drilling and construction will be approved in accordance with the following schedule. NOTE: Removal and replacement of chain link fence and the furnishing of ground projection mats shall be incidental to Center South Production Well Drilling and Construction work.

- A. Drill, Furnish, and Install 24-Inch Surface Casing. Measurement and payment for the drilling, installation, cementing, and backfilling of the surface casing shall be based on the linear footage emplaced in the production well. Payment for the casing shall serve as full compensation for the casing, centralizers, cement, fill, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- B. Drill Production Well 20-Inch Borehole. Measurement and payment for drilling the borehole in accordance with these Contract Documents shall be based upon the linear footage actually drilled. All drilling will be measured on an in-place completed linear foot basis as called on the Bid Schedule. Payment for drilling shall be full compensation for rig, fuel, air compressors, mud pumps, bits, labor, drilling fluids, and incidentals necessary to complete the hole in accordance with these Contract Documents. The respective unit price will compensate the Contractor for all bits used and wear and tear on equipment, regardless of borehole diameter.
- C. Furnish and Install 14-Inch Pipe Size Stainless Steel Screen. Measurement and payment for the screen shall be based on the linear footage emplaced in the production well. Payment for the screen shall serve as full compensation for the screen, bottom plate, centralizers, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- D. Furnish and Install 14-Inch Blank PVC Casing. Measurement and payment for the casing shall be based on the linear footage emplaced in the production well. Payment for the casing shall serve as full compensation for the casing, centralizers, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- E. Furnish and Install 14-Inch Blank Steel Casing. Measurement and payment for the casing shall be based on the linear footage emplaced in the production well. Payment for the casing shall serve as full compensation for the casing, centralizers, transportation, installation costs and labor, and other incidentals required to deliver it to the work site and install it in the well. Drilling, reaming, mud, bits and related costs associated with drilling shall be incidental.
- F. Furnish and Install Gravel Pack. Measurement and payment for furnishing and installing the gravel pack will be based on the linear footage of material emplaced in the annular space, all in accordance with these Contract Documents. Payment for the gravel at the unit price listed on the Bid Schedule shall constitute full compensation for furnishing all tools, rigs, equipment, tremie pipes, labor,

materials, and incidentals necessary to gravel pack each well in accordance with these Contract Documents.

- G. Furnish and Install Grout. Measurement and payment for furnishing and installing the cement grout will be based on linear footage emplaced in the annular space, all in accordance with these Contract Documents. Payment for the grout at the unit price listed on the Bid Schedule shall constitute full compensation for furnishing all tools, rigs, equipment, tremie pipes, labor, materials, cement and incidentals necessary to cement the well at the specified site in accordance with these Contract Documents. The Contractor shall allow for 10 percent overrun in materials to compensate for any washouts in the borehole.
- H. Rig Time. Measurement for rig time will be measured and compensated by the hour. Payment shall be full compensation for rig, fuel, air compressors, labor, drill bits, and incidentals necessary to perform the work. Rig time shall be paid only when authorized in writing by the Engineer.
- I. Standby Time. Standby time shall be the time when the drill rig is shut down, although in readiness to begin or resume operations, while the Contractor is waiting on orders of the Engineer or on materials or services or other items to be furnished by the Engineer. The Contractor shall be reimbursed for standby time at the unit-price-per-hour bid. Standby time shall not include such items as waiting for cement to cure, flow testing, or delivery of materials to site, among other items. Standby shall be paid only when authorized in writing by the Engineer.
- J. Pull Existing Pumping Equipment and Abandon Well. Measurement and payment for the abandonment of the existing Center South well will include removal of all pumping equipment, including the drivehead, line shaft, column pipe, etc. and the placement of all annular materials needed to complete the abandonment in compliance with Colorado State Engineer's Office Rules and Regulations.

ITEM	DESCRIPTION	UNIT
02800-10	Drill, Furnish, and Install 24-Inch Surface Casing	linear foot
02800-11	Drill Production Well 20-Inch Borehole	linear foot
02800-12	Furnish and Install 14-Inch Stainless Steel Screen	linear foot
02800-13	Furnish and Install 14-Inch Blank PVC Casing	linear foot
02800-14	Furnish and Install 14-Inch Blank Steel Casing	linear foot
02800-15	Furnish and Install Gravel Pack	linear foot
02800-16	Furnish and Install Grout	linear foot
02800-17	Rig Time	hour
02800-18	Standby Time	hour
02800-19	Pull Existing Pumping Equipment and Abandon Well	lump sum

1.05 VIDEO LOGGING (re. Section 02810)

Measurement for payment for providing a color downhole video log of the production well will be based on a lump sum basis. Payment shall constitute full compensation for furnishing all tools, equipment, labor, mileage and per diem for completion of each video logging effort. There will be no payment for lost tools.

ITEM	DESCRIPTION	UNIT
02810-01	Down Hole Video	lump sum

1.06 WELL DEVELOPMENT (re. Section 02820)

Measurement and payment shall be based upon an hourly charge and shall include all labor, rig time, fuel, compressors, and drilling incidentals to maintain the operation. Actual hours expended and measured will be agreed between the Contractor and the Engineer. Payment shall constitute full compensation for the well development operation. The lump sum price shall also include furnishing temporary power and discharge piping to complete field testing.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
02820-01	Well Development	hour

1.07 AQUIFER TESTING (re. Section 02830)

Payment for aquifer testing of the production well will be approved in accordance with the following schedule.

- A. Mobilize and Set Test Pump. Measurement for payment shall be based on each well and shall include all labor, equipment, pipeline, valves, and flow measuring devices to set the test pump, assemble and attach the discharge line, and to remove and disassemble the test equipment in accordance with these Contract Documents. Payment shall constitute full compensation for furnishing all tools, equipment, labor, mileage, and per diem for the completion of the aquifer testing effort. The lump sum price shall also include furnishing temporary power and discharge piping to complete field testing.
- B. Conduct Aquifer Testing. Measurement and payment shall be based upon an hourly charge, and shall include all labor, materials, transportation, and per diem expenses involved in conducting the test and monitoring the pump. Payment will be for the hours actually spent testing the well. There will be no payment for the time elapsed while the well recovers. There will be no adjustment in unit price due to shortening or lengthening of the aquifer test.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
02830-01	Mobilize and Set Test Pump	lump sum
02830-02	Conduct Aquifer Testing	hour

1.10 DISINFECTION (re. Section 02840)

Measurement and payment for disinfection of the well will be based upon completion of the work as a per well unit. Payment will be made for the site price listed in the Bid Schedule. The price will constitute full payment for labor, furnishing all tools, equipment, materials, chemicals, testing fees and other incidentals necessary to adequately disinfect and evaluate each completed well in accordance with specifications. All disinfection of equipment prior to entrance to the site and between holes shall be incidental to mobilization.

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
02840-01	Well Disinfection	lump sum

END OF SECTION 01200

SECTION 01310
PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

Requirements for Pre-construction Conference, progress meetings, and pre-installation conferences.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 COORDINATION

- A. Contractor shall coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly installation sequence of interdependent construction elements.
- B. Contractor shall verify that utility requirement characteristics of operating equipment are compatible with building utilities. Contractor shall coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Contractor shall coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Contractor shall follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Contractor shall utilize spaces efficiently to maximize accessibility for other installations, maintenance, and repairs.
- D. In finished areas, except as otherwise indicated, Contractor shall conceal pipes, ducts, and wiring within the construction. Contractor shall coordinate locations of fixtures and outlets with finish elements.
- E. Contractor shall coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
- F. After City occupancy of premises, Contractor shall coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of City's activities.
- G. Utility Companies
 - 1. The Contractor shall keep the utility companies advised of any work being done to their facility, so that the utility companies can coordinate their inspections for final acceptance of the work with the Project Engineer.
 - 2. The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavation or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two business days prior to commencing such operations. Contact the Utility Notification Center of Colorado (UNCC) to have

location of UNCC registered lines marked by member companies. Calls originating within the Denver area use phone number 534-6700; calls from outside the Denver area use 1-800-922-1987. All other underground facilities shall be located by contacting the respective company. Utility service laterals shall also be located prior to beginning excavating or grading. All costs incidental to the foregoing requirements will not be paid for separately but shall be included in the work.

3. The location of utility facilities as shown on the plan and profile sheets, and herein described, were obtained from the best available information. It is the Contractor's sole responsibility to coordinate and verify the location of all utilities with the respective company.

3.02 PRE-CONSTRUCTION CONFERENCE

- A. Engineer will schedule a Pre-construction Conference after Notice of Award.
- B. Attendance Required: City, Engineer, Contractor, and main subcontractors.
- C. Agenda:
 1. Execution of City-Contractor Agreement.
 2. Submission of executed bonds and insurance certificates.
 3. Distribution of Contract Documents.
 4. Submission of list of Subcontractors, list of products, schedule of values and progress schedule.
 5. Designation of personnel representing the parties in the Contract and the Engineer.
 6. Procedures and processing of field decisions, submittals, substitutions, applications for payment, proposal requests, Change Orders, and Contract closeout procedures.
 7. Procedures for maintaining record documents.
 8. Use of premises by Contractor and City.
 9. Public utility coordination.
 10. Survey and layout.
 11. Scheduling.

3.03 PROGRESS MEETINGS

- A. Contractor shall schedule and hold progress meetings as requested by the City of Greeley or required by the Work.
- B. The Contractor shall make arrangements for progress meetings, prepare agendas with copies for participants, preside at meetings, record minutes and distribute copies within seven days to Engineer, City, participants and those affected by decisions made.

- C. Attendance Required: Contractor and Job Superintendent, City of Greeley Representative, and others as may be requested by Contractor, or City of Greeley's Representative.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress and schedule.
 - 3. Field observations, problems and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittal schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Review of pending Change Orders.
 - 14. Other business relating to Work.
- E. City of Greeley's Representative shall preside at meetings and record and distribute minutes to the participants.

3.04 PRE-INSTALLATION CONFERENCES

- A. When required in an individual specification section, the Contractor will convene a pre-installation conference at the work site prior to commencing work under the section.
- B. Require attendance of parties directly affecting, or affected by, work under the section.
- C. Notify Engineer five days in advance of the conference.
- D. The Contractor shall prepare agenda, preside at conference, record minutes, and distribute copies within seven days to participants and the Engineer.
- E. The Contractor shall review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

NOT USED

END OF SECTION 01310

SECTION 01320

SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittal Procedures
- B. Construction Progress Schedules
- C. Proposed Products List
- D. Shop Drawings
- E. Product Data
- F. Samples
- G. Manufacturers' Instructions
- H. Manufacturers' Certificates

1.02 RELATED SECTIONS

Section 01010 – Summary of Work
Section 01310 – Project Meetings
Section 01450 – Quality Control
Section 01600 – Product Requirements
Section 01700 – Contract Closeout
Section 01785 – Project Record Documents
Section 02800 – Production Well Drilling and Construction

1.03 QUALITY ASSURANCE

- A. Submittal Schedule:
 - 1. The Submittal Schedule shall be coordinated with the Construction Progress Schedule required by the Conditions of the Contract. The Submittal Schedule shall allow two weeks in the Contractor's schedule for submittal review.
 - 2. Make necessary corrections based on the Engineer's review and resubmit revised Submittal Schedule along with the required Progress Schedule.
 - 3. As the Progress Schedule is changed and/or updated, the Submittal Schedule shall be adjusted accordingly.
 - 4. No extension of time will be granted, nor will consideration be given to claims arising out of the Contractor's failure to submit shop drawings, product data, samples, or related submittals which do not allow adequate lead time for Engineer's review, and also do not allow ample time for revision, resubmission, and subsequent review by Engineer as required.

1.04 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer-accepted form.
- B. Sequentially number the transmittal forms. Number re-submittals with the original number and an alphabetic suffix.
- C. Identify project, Contractor, subcontractor or supplier, pertinent drawing sheet and detail number(s), and Specification Section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the project and deliver to Engineer at business address. Coordinate submission of related items.
- F. Identify variations from Contract Documents and product or system limitations, which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Engineer review stamps.
- H. Revise and resubmit submittals as required. Follow the same procedure as the initial submission. Identify all changes made since previous submittal.
- I. Engineer will perform only two reviews on a specific submittal. If additional review by the Engineer is required, the Contractor shall bear all costs associated with the additional review.
- J. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- K. Review and approval or acceptance of a submittal by the Engineer does not relieve the Contractor of his responsibility under the Contract Documents.

1.05 CONSTRUCTION PROGRESS SCHEDULES

- A. Contractor shall coordinate all activities on the project.
- B. Within 10 days after the date established for "Notice to Proceed", submit a Progress Schedule in format approved by the City and Engineer, with separate listing for each major trade or item of Work.
- C. Revise and resubmit as required.
- D. Submit revised schedules with each Application for Payment or as required by the City or Engineer, identifying changes since previous version.
- E. Submit a horizontal bar chart with separate lines for each major section of Work or operation identifying first work day of each week, showing complete sequence of construction by activity, and identifying Work of separate stages and other logically grouped activities.
- F. Indicate estimated percentage of completion for each item of Work at each submission.

- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates including those furnished by City.

1.06 PROPOSED PRODUCTS LIST

- A. Prior to the Pre-construction Conference, the Contractor shall submit a complete list of major products proposed for use, with name of manufacturer, trade name, and model number for each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.07 SHOP DRAWINGS

- A. Submit to the Engineer three copies plus additional copies for return to the Contractor (maximum of nine) or submit electronically as a readable PDF via email.
- B. Shop drawings require preparation and certification by either a licensed engineer or architect where applicable. They shall carry an original seal and signature on the three copies.
- C. After review, reproduce and distribute in accordance with Article on Procedures above and maintain copies of Record Documents required for Contract Closeout.
- D. Should the Contractor propose any item on his shop drawings, or incorporate any item into the work, and that item should subsequently prove to be defective or otherwise unsatisfactory (regardless of the Engineer's preliminary review), the Contractor shall, at his own expense replace the item with another that will perform satisfactorily.
- E. Do not allow shop drawing copies into field without appropriate final approval markings by Engineer.

1.08 PRODUCT DATA

- A. Submit three copies plus additional copies for return to Contractor (maximum of nine).
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement the manufacturers' standard data to provide information unique to this project.
- C. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700, Contract Closeout.

1.09 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures and patterns for Engineer's selection.

- C. Include identification on each sample, with full project information.
- D. Submit the number of samples specified in individual Specification sections, one of which will be retained by Engineer.
- E. Review samples which may be used in the Work are indicated in individual Specification sections.

1.10 MANUFACTURERS' INSTRUCTIONS

- A. Distribute copies of manufacturer's instructions to all parties involved in the installation, including the City and Engineer. Maintain one complete set of all manufacturers' instructions on the jobsite until completion and approval of the entire Work.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.11 MANUFACTURERS' CERTIFICATES

- A. When specified in individual Specification sections, submit manufacturers' certificate and warranties to Engineer for review, in quantities specified for product data.
- B. Indicate that material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.

1.12 SUBMITTAL

- A. The Contractor shall identify shop drawings in accordance with the following coded designation:
 - 1. Shop Drawings
 - 2. Product Data
 - 3. Samples
 - 4. Manufacturer's Instructions
 - 5. Manufacturer's Certification
- B. The following items shall require the following submittals

Table 01320-1.11

Specification Section	Code Designation				
	1	2	3	4	5
02800 – Production Well Drilling and Construction	X	X			
02820 – Well Development	X				
02830 – Aquifer Testing	X				X

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

PART 4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

NOT USED

END OF SECTION 01320

DIVISION 02

**CITY OF GREELEY
LINN GROVE IRRIGATION WELLS PROJECT**

**DIVISION 02
CONTENTS**

Section 02700	Mobilization
Section 02800	Production Well Drilling and Construction
Section 02810	Video Logging
Section 02820	Well Development
Section 02830	Aquifer Testing
Section 02840	Disinfection

SECTION 02700

MOBILIZATION

PART 1 GENERAL

1.01 GENERAL

Mobilization shall include obtaining City required permits, insurance and bonds, moving plant materials and equipment onto the site, and furnishing and erecting plants, temporary buildings, and other construction facilities, all as required for the proper performance and completion of the Work. Demobilization shall be part of Mobilization.

The Contractor shall provide all labor, materials, and equipment to prepare the irrigation water supply well sites for the timely start and efficient completion of all work. One mobilization payment will be made for the irrigation well drilling and completion. Multiple mobilizations to the property will be at the Contractor's sole expense. All drilling equipment shall be cleaned and disinfected prior to entrance to the site. Bits and tools shall be disinfected between drill sites. Cost of disinfection shall be incidental to Mobilization.

PART 2 MATERIALS AND PRODUCTS

Not Used

PART 3 EXECUTION

3.01 MOBILIZATION

- A. Upon receiving the Notice to Proceed, the Contractor shall move in all tools, equipment, and supplies necessary for the Work, and upon completion of the Work, shall remove all such items from the premises promptly and leave the site in a clean, reclaimed, and orderly fashion. If desired to mobilize equipment to the site prior to having the site sufficiently prepared for the drill rig, the Contractor shall secure written permission from both the Engineer and the City.
- B. Mobilization shall include, but not be limited to, the following principal items.
 1. Submitting of all required insurance certificates, insurance policies, bonds, licenses, and submittals.
 2. Obtaining any City required permits. The City has filed and/or obtained permits for borehole drilling and well construction (Colorado SEO). The City and Engineer have obtained access to the site. All permits, easements, and conditions therein are made part of these Contract Documents. The Contractor shall comply with the provisions and conditions of these permits. The Contractor is required to obtain the following permit: a General Construction permit. Permits can be obtained using the city's eTRAKiT portal at <https://trakit.greeleygov.com/etrakit/>. Permit fees for this will be waived by the City.
 3. Groundwater will be discharged to land surface under the appropriate Colorado Department of Public Health and Environment policy.

4. If using water not supplied by the City, the Contractor is required to obtain a miscellaneous use permit from the Colorado State Engineer's Office for water to be used for drilling.
5. Disinfection and preparation of equipment prior to mobilization. Moving the Contractor's drill rigs, plant, and equipment required for the project onto the site.
6. Installing temporary construction power, wiring, and lighting facilities as required.
7. Moving all required drill stem, casing, drill bits, shoes, portable drilling fluid pits, backhoes, etc., onto the site.
8. Furnishing drilling fluid tanks, temporary buildings, and other construction facilities, as required for the proper performance and completion of the Work.
9. Providing on-site sanitary facilities as specified.
10. Arranging for and erection of Contractor's work and storage yard and arranging for all utility locates.
11. Posting all OSHA required notices and establishment of safety programs.
12. Having the Contractor's superintendent at the job site full time.
13. Submittal of Preliminary Construction Schedule.
14. Demobilization from the site, which shall include removal of all of the Contractor's equipment, facilities, personnel, and temporary power from the site. Demobilization shall also include final grading, blading, site restoration, and cleanup of the work site and Contractor's facilities.

3.02 DRILL SITE PREPARATION

- A. Preparation of the drill site shall be the responsibility of the Contractor. The Contractor shall supply sufficient above ground tanks to contain all of the drilling fluids generated during the drilling process. Any site grading and provision of the above ground tanks shall be considered a part of mobilization and demobilization. Minimal if any site preparation is anticipated for drilling.
- B. For Work sites in close proximity to public roads and residences, the Contractor shall provide, at his own expense, fencing around the Work sites for security and safety. The type of fencing shall be at the discretion of the Contractor, but must be at least three to four feet in height with slat or woven spacing to be approximately one to two inches in width. The Contractor shall be responsible for protecting life and property. No drilling fluids shall leave the drilling site, and drilling disturbance shall be completely restored.

3.03 DEMOBILIZATION

- A. Demobilization from the well sites shall include removal of all of the Contractor's equipment, facilities, personnel, temporary power from the sites. Demobilization

shall also include final grading, blading, and cleanup of the work site and the Contractor's facilities.

3.04 SITE RESTORATION

- A. All excess drilling fluids, debris, and other materials used during these operations shall be removed and properly disposed of by the Contractor. Drilling fluids, drill cuttings, and development fluids may be disposed of at the cemetery at points acceptable to the City. Following testing operations, any holes shall be filled, compacted, graded, and the sites returned to a condition better than or equal to its condition at the commencement of Work, as approved by the Engineer.
- B. The Contractor shall promptly remove his equipment, temporary facilities, and materials, and leave the sites in a condition acceptable to the Engineer. The Contractor shall repair any damage to property or facilities caused by his operations prior to final acceptance of the Work by the Engineer. All roadways and adjoining paved surfaces shall be returned to their original condition and appearance by the Contractor as soon as reasonably feasible and in accordance with applicable land requirements. Disturbed turf and natural grass areas shall be final graded prior to final demobilization. The city will be responsible for reseeding the disturbed areas.

PART 4 MEASUREMENT AND PAYMENT

See Section 01200.

END OF SECTION 02700

SECTION 02800

PRODUCTION WELL DRILLING AND CONSTRUCTION

PART 1 GENERAL

1.01 PRODUCTION WELL

- A. This section outlines the requirements for the drilling and construction of two irrigation water supply wells to be built at the selected drill sites at the Linn Grove Cemetery. The locations of the irrigation wells to be drilled, constructed, developed, and tested are shown on Figure 1 in Appendix A.
- B. The Contractor is to furnish all materials, supplies, equipment, and personnel necessary to successfully complete the wells and any appurtenant structures in a timely and professional manner. The wells shall be constructed in general accordance with the Colorado State Engineer's Office Water Well Construction Rules.
- C. The work shall be carried out in accordance with the following specifications and any amendments or additions that may be attached by the City or Engineer. Work to be performed in the presence of the Engineer is so indicated within these specifications.

1.02 RELATED SECTIONS

Section 01010 – Summary of Work
Section 01320 – Submittals
Section 02810 – Video Logging
Section 02820 – Well Development
Section 02830 – Aquifer Testing
Section 02840 – Disinfection

1.03 REFERENCES

Colorado State Engineer's Office Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction.

1.04 SUBMITTALS

The Contractor shall keep records providing the following information. The following records will be presented to the Engineer during the course of the project or following the completion of all operations at the drill site.

- A. Driller's Log. The driller's log shall include all information pertinent to the production well construction and the progress of work. The driller's log shall be a running account which includes: (1) drilling fluids and additives, including quantity of materials used; (2) drilling fluid properties, including weight, fluid loss, and viscosity; (3) type and diameter of bits used for drilling and total footage for each bit; (4) penetration rate log using a single-pin Geolograph or Engineer-approved equivalent; and (5) any remarks or comments concerning the drilling characteristics of the borehole, including circulation loss, special or peculiar events, etc. The forms shall be kept onsite during drilling for inspection by the City or Engineer.

- B. Materials Log. The Contractor shall keep a record of the assembled order, number, type, size, lengths and couplings of any applicable individual pieces of casing, screen, blank, centralizers, and other items placed in the well.
- C. Material Certificates. Manufacturers' and suppliers' certificates and invoices for all materials delivered and services rendered to the job site shall be maintained. The certificates and invoices shall describe the material delivered including weight, class or grade, quantity and unit cost, etc. Copies of these certificates shall be provided to the Engineer upon delivery of materials to the site.

PART 2 MATERIALS AND PRODUCTS

2.01 DRILLING FLUIDS

- A. Material. The selection of drilling fluids shall be at the discretion of the Contractor, with the approval of the Engineer. The drilling fluid may consist of water mixed with polymers, or other Engineer-approved materials. Fresh water from a source approved by the Engineer shall be used as the base for the drilling fluid, whether used alone or in combination with Engineer-approved drilling fluid additives. If there should be a conflict between the drilling fluid requirements for ease of drilling and drilling fluid requirements for aquifer protection, then the ruling requirements shall be those for aquifer protection. The drilling fluid shall possess characteristics required to: (1) prevent caving as drilling progresses; (2) permit recovery of representative drill cutting samples; (3) maintain the structural integrity of the borehole during casing installation; and (4) minimize fluid loss and buildup of wall cake. If requested by the Engineer, the Contractor will employ a qualified drilling fluids engineer onsite with more than two years of experience to ensure the viability of the drilling fluid. The Contractor shall bear the costs of the drilling fluids engineer.
- B. Lost Circulation. In the event of lost circulation conditions, the Contractor shall notify the Engineer and City for approval of using lost circulation materials, and shall use micaceous flakes or other Engineer-approved inert inorganic materials to regain drilling fluid circulation. Upon completion of borehole drilling, the Contractor must use appropriate procedures to remove drilling fluid additives and/or lost circulation materials during development.

2.02 WELL D SCREEN, CASING, AND ANNULAR MATERIALS

- A. 28 Inch Steel Surface Casing. The Contractor shall install 20 linear feet of Schedule 40, 28 inch diameter surface casing at the well site, or Engineer-approved equivalent.
- B. 18 Inch Stainless Steel Pipe Size Well Screen. Approximately 15 feet of new 18-inch pipe size well screen having a slot size of 0.090 inches will be required to complete the construction of Well D. The screen shall be constructed of Type 304 stainless steel, and be a Hi-Flow™ V-slot, continuous wire-wrapped type. The screen shall be manufactured by Johnson Screens, Inc. or Engineer-approved equivalent, and shall be rated for a depth setting of 250 feet. The ends of the screens shall be beveled for welded joints or supplied with threads and couplings. The joining of the screen sections shall be conducted by properly qualified operators, or welders, as appropriate.

- C. 18 Inch PVC Well Casing. Approximately 30 feet of 18-inch, Schedule 40 PVC blank well casing will be required to complete the construction of Well D. The well casing shall conform to the physical and chemical properties of ASTM F480, or equivalent approved by the Engineer. The casing shall be new. The casing shall be supplied with threads and couplings or with belled and spline locked ends, and be suitable for attachment to the stainless steel screen.
- D. 18 Inch Steel Well Casing. Approximately 21 feet of 18-inch blank Schedule 40 steel well casing will be required to complete the construction of Well D. The casing shall be constructed of ASTM A53 Grade B steel, or Engineer-approved equivalent. The casing shall be new. Rusted casing will not be accepted. The casing shall be supplied with threads and couplings, or beveled ends for welded joints, and suitable for attachment to the PVC casing.
- E. Well Bottom Cap. For the well, the bottom of the well casing shall be enclosed with a PVC cap.
- F. Centralizers. Centralizers manufactured to fit the casing will be used in the installation of the casing and screen in the borehole. To maintain the casing in the center of the borehole, centralizers shall be installed at approximately 20, 42, and 62 feet below ground surface, or as directed by the Engineer. The type and configuration of the centralizers to be used is at the option of the Contractor with the approval of the Engineer.
- G. Gravel Pack. The annular space around the stainless steel screen and PVC casing shall be filled with gravel pack from the borehole bottom to a depth of approximately 20 feet below ground surface at the well site. The gravel pack will consist of a #90 (4x10) silica gravel pack. The gravel pack shall be manufactured by Red Flint™, or Engineer-approved equivalent. The gravel pack shall consist of well-rounded, hard, 90 to 95 percent quartz grains that have been washed clean and dried, having a uniformity coefficient of 2.5 or less. The gravel pack will be placed into the annular space via tremie pipe. Approximately two feet of 3/8-inch bentonite chips shall be placed above the gravel pack in the well to prevent cement from migrating into the gravel pack. The cost of the bentonite chips shall be incidental to the Gravel Pack.
- H. Cement Seal/Grout. The well casing for the irrigation well shall be cemented in place with neat cement or cement bentonite grout extending from approximately land surface to 20 feet below ground surface. The Contractor shall allow for at least 10 percent overrun on cement to compensate for washout zones in the borehole. In the event more than 10 percent excess is required to completely cement the casings in place, then the Contractor shall be paid for the excess at the unit price on the Bid Schedule. The Contractor shall provide the Engineer an estimate of the volume of cement required for each cementing operation, inclusive of any required overage, prior to placing an order for cement.

2.03 CENTER SOUTH SCREEN, CASING, AND ANNULAR MATERIALS

- A. 24-Inch Steel Surface Casing. The Contractor shall install 20 linear feet of Schedule 40, 24-inch diameter surface casing at the well site, or Engineer-approved equivalent.

- B. 14-Inch Stainless Steel Pipe Size Well Screen. Approximately 10 feet of new 14-inch pipe size well screen having a slot size of 0.090 inches will be required to complete the construction of the Center South well. The screen shall be constructed of Type 304 stainless steel, and be a Hi-Flow™ V-slot, continuous wire-wrapped type. The screen shall be manufactured by Johnson Screens, Inc. or Engineer-approved equivalent, and shall be rated for a depth setting of 250 feet. The ends of the screens shall be beveled for welded joints or supplied with threads and couplings. The joining of the screen sections shall be conducted by properly qualified operators, or welders, as appropriate.
- C. 14-Inch PVC Well Casing. Approximately 25 feet of 14-inch blank Schedule 40 PVC well casing will be required to complete the construction of the Center South well. The well casing shall conform to the physical and chemical properties of ASTM F480, or equivalent approved by the Engineer. The casing shall be new. The casing shall be supplied with threads and couplings or with belled and spline locked ends, and be suitable for attachment to the stainless steel screen.
- D. 14-Inch Steel Well Casing. Approximately 21 feet of 14-inch blank Schedule 40 steel well casing will be required to complete the construction of the Center South well. The casing shall be constructed of ASTM A53 Grade B steel, or Engineer-approved equivalent. The casing shall be new. Rusted casing will not be accepted. The casing shall be supplied with threads and couplings, or beveled ends for welded joints, and suitable for attachment to the PVC casing.
- E. Well Bottom Cap. For the well, the bottom of the well casing shall be enclosed with a PVC cap.
- F. Centralizers. Centralizers manufactured to fit the casing will be used in the installation of the casing and screen in the borehole. To maintain the casing in the center of the borehole, centralizers shall be installed at approximately 20, 32, and 47 feet below ground surface or as directed by the Engineer. The type and configuration of the centralizers to be used is at the option of the Contractor with the approval of the Engineer.
- G. Gravel Pack. The annular space around the stainless steel screen and PVC casing shall be filled with gravel pack from the borehole bottom to a depth of approximately 20 feet below ground surface at the well site. The gravel pack will consist of a #90 (4x10) silica gravel pack. The gravel pack shall be manufactured by Red Flint™, or Engineer-approved equivalent. The gravel pack shall consist of well-rounded, hard, 90 to 95 percent quartz grains that have been washed clean and dried, having a uniformity coefficient of 2.5 or less. The gravel pack will be placed into the annular space via tremie pipe. Approximately two feet of 3/8-inch bentonite chips shall be placed above the gravel pack in the well to prevent cement from migrating into the gravel pack. The cost of the bentonite chips shall be incidental to the Gravel Pack.
- H. Cement Seal/Grout. The well casing for the irrigation well shall be cemented in place with neat cement or cement bentonite grout extending from approximately land surface to 20 feet below ground surface. The Contractor shall allow for at least 10 percent overrun on cement to compensate for washout zones in the borehole. In the event more than 10 percent excess is required to completely cement the casings in place, then the Contractor shall be paid for the excess at

the unit price on the Bid Schedule. The Contractor shall provide the Engineer an estimate of the volume of cement required for each cementing operation, inclusive of any required overage, prior to placing his order for cement.

2.04 WELLHEAD CONSTRUCTION

For both Well D and Center South, the Contractor shall extend the well casing one foot above the ground surface and install a temporary weather tight locking security cover after all Work associated with well construction, development, and testing is completed. All above ground metal shall be primed and painted with a brightly colored rust-resistant paint.

PART 3 EXECUTION

3.01 BOREHOLE DRILLING

- A. The Contractor shall provide all necessary equipment that assures proper and timely execution and completion of the project in accordance with these Contract Documents. The Contractor is encouraged to suggest modifications if such modifications will meet the project objectives, expedite drilling and well construction, and save project costs. For the production wells, the Contractor will drill the borehole utilizing either direct or reverse rotary water-based drilling fluid techniques to allow for well completion into the bedrock. The Contractor shall indicate on the Bid Schedule and in his submittals which circulation and drilling techniques he intends to use to drill the production wells.
- B. The Contractor shall take measures necessary to protect the top portions of the borehole from caving or raveling. The surface casings shall be installed in boreholes approximately six inches larger than the casing diameter a depth of approximately 20 feet below ground surface. The Contractor shall then drill an approximately 6-inch larger borehole than the production casing and screen diameter to a depth of approximately two feet below the design well depth. The anticipated well completion depth varies between the wells as noted on the conceptual well designs included in Appendix A, but the exact depth of the well will be determined by the Engineer during drilling. The final drilling depth will depend upon geologic conditions encountered in the borehole.
- C. The drilling fluid properties shall be maintained in such a manner as to ensure the structural integrity of the borehole, to minimize fluid loss and wall cake buildup, to adequately clean the borehole, and to circulate drill cuttings representative of the strata penetrated to the ground surface. All chemical or mineralogical additives must be suitable for introduction into a potable water supply. The Contractor may be required to retain or employ an experienced, qualified, and Engineer-approved drilling fluids engineer on the job during all drilling and completion operations to supervise and maintain the drilling fluid characteristics. Retainer fees or compensation for the drilling fluids engineer shall be the sole responsibility of the Contractor. The use of above ground tanks for controlling drilling fluids and containing drill cuttings during borehole drilling will be required to minimize surface disturbance at the cemetery.
- D. If the Contractor believes lost circulation conditions have been encountered, the Contractor shall make a recommendation to the Engineer on how to remedy the situation. Thickening of the drilling fluid and use of standard fluid additives are not considered remedial lost circulation measures. The Engineer shall review lost

circulation conditions and Contractor methodologies to regain circulation, and approve, reject, or propose a substitute. Lost circulation shall be at the approval of the Engineer. Upon approval, the Contractor shall immediately implement remedial measures to regain circulation using lost circulation materials listed in these specifications. If after working four hours to reestablish circulation, the loss of circulation is not overcome, the Contractor shall submit a written remedial methodology to regain circulation. Upon Engineer approval of this written plan, all additional Contractor work to regain circulation, including any footage gained, shall be at the hourly rig time rate. All lost circulation materials and mud used in attempting to restore circulation shall be paid by the City at invoice cost plus 10 percent to cover transportation and handling.

- E. The Contractor shall be aware that obtaining good quality and representative soil, cuttings, rock flour, and formation samples from the borehole is an essential aspect of this drilling project. The Contractor shall sample the drill cuttings as directed by the Engineer, at a minimum of 5-foot intervals. Each sample shall be stored in insect- and mildew-proof sample bags. Each sample bag shall be labeled with depth interval, date, time, well name, and location. Sample bags containing the drill cuttings shall be stored in wooden crates or cardboard equivalent in a warm (above freezing), clean, dry area near each well. All samples are to be submitted to the Engineer.
- F. All drilling fluids shall be disposed of in accordance with state and federal regulations. Method and place of disposal shall be approved by the City and Engineer. Costs incurred in connection with the disposal of drilling fluids and developed water will be borne by the Contractor.

3.02 PLUMBNESS AND ALIGNMENT

- A. The Contractor shall construct the production wells sufficiently straight and plumb to permit free installation and removal, without binding, of a test pump in the well. It shall be the responsibility of the Contractor to see that the well is being constructed straight and plumb at all times. Any indications of inadequate plumbness or alignment during drilling, casing, or pump setting operations shall be cause to require measurement of plumbness and alignment by a method acceptable to the Engineer. No payment shall be made for tests of alignment; any such tests shall be included in the costs bid for other items in this Contract.
- B. If the well is of unacceptable plumbness and alignment, the Contractor shall undertake remedial measures. Any alignment work required by the Contractor in redrilling or straightening the well shall be at his sole expense. If a well is deemed unacceptable following remedial measures, then as much casing as can be removed from the well shall be salvaged by the Contractor. The well shall be abandoned in accordance with Colorado state regulations at the Contractor's expense. All repeated work, additional materials, labor, and equipment required to drill and construct the replacement well, satisfying the plumbness and alignment specifications outlined in Section 3.02A above, shall be furnished at the expense of the Contractor, and no claim for additional compensation shall be made or be allowed except as specifically provided within these Contract Documents.

3.03 INSTALLATION OF WELL CASING, SCREEN, GRAVEL PACK, AND CEMENT SEALS

- A. Stainless Steel Screen Assembly. Following completion of each production borehole, the Contractor shall verify the total depth of the borehole and/or clean out the boreholes as needed to restore the total depth to that drilled. The Contractor shall report the total depth of the hole to the Engineer immediately before setting the screen. The Contractor shall install the pipe size stainless steel screens in accordance with the final well design furnished by the Engineer. The Contractor shall assure that the capacity of his equipment is adequate to hang the designed casing weight.
1. The casing and screen assembly shall not be supported from the bottom of the borehole at any time during installation.
 2. Individual lengths of casing or screen shall be joined by either threads and couplings, spline lockable connections, or welding. Any couplings used shall be joined in accordance with the manufacturer's recommendations. Any welding of the well casing and screen shall be performed by properly qualified operators and welders following the manufacturer's recommendations.
 3. Centralizers shall be installed at 20-foot intervals, or as directed by the Engineer. The centralizers may be welded or attached to the casing or the blank portion at the ends of screen sections, but no welding shall be done on the wrapped wire portion of the screens.
 4. The final placement of screen and casing for the well will be determined by the Engineer after examination of drill cuttings from the borehole. The quantities of screen and casing in the Bid Schedule are for price estimation and comparative purposes only.
- B. Casings and Centralizers. The Contractor shall install the PVC and steel casings in accordance with the final design furnished by the Engineer. The Contractor shall assure that the capacity of his equipment is adequate to hang the designed casing weight. Individual lengths of casing shall be joined by either threads and couplings, spline lockable connections, welding, or an Engineer-approved alternative. Any couplings used shall be connected in accordance with the manufacturer's recommendations. Any welding of the well casing shall be performed by properly qualified operators and welders following the manufacturer's recommendations. The casing shall not be supported from the bottom of the borehole at any time during installation. For Well D, centralizers shall be installed on the casings at approximately 20, 42, and 62 feet bgs, as directed by the Engineer. For Center South, centralizers shall be installed on the casings at approximately 20, 32, and 47 feet bgs.
- C. If the casing string cannot be positioned according to the final well design furnished by the Engineer, then the Contractor shall remove all casing from the borehole and undertake remedial measures. Failed casing due to collapse or breakage associated with installation, removal, or other construction activity prior to well completion shall be withdrawn and replaced at the Contractor's expense. If remedial measures are insufficient to permit well construction in accordance with the final well design, the Contractor shall construct another well immediately adjacent to the original location in accordance with these Contract Documents. The abandoned borehole shall be abandoned and sealed in accordance with

state regulations at the sole expense of the Contractor. All repeated work, additional materials, labor, and equipment required to rehabilitate or reconstruct the well prior to well completion shall be furnished at the expense of the Contractor, and no claim for additional compensation shall be made or be allowed except as specifically provided within these Contract Documents.

- D. Gravel Pack. At the well site, the Contractor will tremie a 4x10, #90 Red Flint gravel pack, or engineer-approved equal, into the annular space between the well screen and the borehole wall. The Contractor shall ensure that his drilling fluid has been sufficiently thinned and is relatively free of solids prior to placing the pack. The gravel pack will extend below the screened interval to the bottom of the drilled borehole and extend above it to a depth of approximately 20 feet below ground surface. The Contractor will measure the top of the sand pack at regular intervals during installation.
- E. Cement Seal. The production well casings shall be cemented in place. The casing shall be suspended in the borehole and cemented in place by pressure circulation of cement grout from bottom to top via tremie pipe. Cementing shall be performed by the Contractor. The cement used shall conform to the specifications of Article 2.02H above. The cement shall be allowed to cure a minimum of 24 hours, or more if directed by the cementing subcontractor, before continuing operations on the well. One sample of the cement installed in the annular space will be collected by the Contractor in appropriate containers and presented to the Engineer for inspection to ensure that the cement sets in a reasonable timeframe. The samples shall be collected at the beginning and at the end of the pour and labeled accordingly.

3.04 WELLHEAD CONSTRUCTION

The Contractor shall extend the well casing one foot above the ground surface and install a temporary weather tight locking security cover after all Work associated with well construction, development, and testing is completed. All above ground metal shall be primed and painted with a brightly colored rust-resistant paint. No payment shall be made for this item; it shall be included in the unit price bid to furnish and install the steel casing.

3.05 PLUGGING AND ABANDONMENT

- A. To complete the replacement well for Center South, the Contractor will first pull existing pumping equipment from and abandon the well. The City will complete the demolition of the well building and cistern to provide space for the completion of the replacement well adjacent to the current location of Center South.
- B. Any well or borehole plugging and abandonment shall meet the Colorado State Engineer's Office Rules and Regulations for water wells.
- C. In the event that the Contractor fails to complete a well to the designed depth, or should he abandon the well because of loss of his tools or equipment downhole, or for any other cause related to deficiencies in his equipment or performance, the Contractor shall plug and abandon the well in accordance with Colorado state regulations after removing as much casing as can be salvaged. All plugging and abandonment work shall be done at the sole expense of the Contractor. All salvaged materials furnished by the Contractor shall remain his property.

- D. Materials. Casings shall be filled above the water table with clean gravel, and then cemented in place with neat cement, high solids bentonite grout, or Engineer-approved equivalent to land surface. The services of a cementing service company shall not be required for this procedure if the Contractor can demonstrate competence in producing the desired result.

PART 4 MEASUREMENT AND PAYMENT

See Section 01200.

END OF SECTION 02800

SECTION 02810
VIDEO LOGGING

PART 1 GENERAL

1.01 VIDEO LOGGING

The Contractor shall complete video logging of the well once during this project, either subsequent to development or following removal of the test pump. All equipment shall be disinfected prior to placement in each irrigation well. The interval to be logged will be the total depth of the completed well subject to satisfactory well conditions. The Contractor shall obtain a color downhole video of each production well.

1.02 RELATED SECTIONS

Section 02800 – Production Well Drilling and Construction

1.03 REFERENCE

Manual of Water Well Construction Practice, EPA-570/9-75-001.

PART 2 MATERIALS AND PRODUCTS

2.01 DOWNHOLE VIDEO

A color downhole video will be completed on each production well. One field copy of the video for the production well will be submitted to the Engineer in the field. The Contractor shall provide three final copies of the video of each production well prior to completion of the project.

PART 3 EXECUTION

3.01 DOWNHOLE VIDEO

The Contractor shall obtain a color downhole video of the well following the completion of all drilling, development work or aquifer testing and disinfection work. The video shall include the full depth of the production well to inspect the condition and location of the blank casing and screen. The Engineer must be present during the video scan and a right angle lens, or 360-degree side scanning capabilities, must be available for use at the direction of the Engineer. Acceptance of this log is at the discretion of the Engineer. From the time his tools are removed from the production well, the Contractor shall allow adequate settlement time to provide a clear video of the well. All additional attempts to provide a clear video log shall be made by the Contractor at his expense.

PART 4 MEASUREMENT AND PAYMENT

See Section 01200.

END OF SECTION

SECTION 02820

WELL DEVELOPMENT

PART 1 GENERAL

1.01 WELL DEVELOPMENT

After the Contractor has finished construction of each irrigation well, the wells shall be developed by a combination of techniques, including but not necessarily limited to, the addition of development additives, mechanical surging and pumping, water jetting and pumping, and/or airlift pumping. The Contractor shall continue to develop the well until most of the drilling fluids and deleterious materials have been removed and the well yields clear water, as determined by the Engineer. The Engineer will be present during development activities, and the Contractor shall not begin or complete development operations without the Engineer's approval. The Contractor shall commence development of the production well within 24 hours of well completion, unless the Engineer approves an alternate schedule. The Contractor must provide the Engineer 48-hour notice if an alternate schedule is to be proposed.

1.02 RELATED SECTIONS

Section 01010 – Summary of Work

Section 01320 – Submittals

Section 02800 – Production Well Drilling and Construction

1.03 REFERENCE

Manual of Water Well Construction Practice, EPA-570/9-75-001.

American Water Works Association Standard for Water Wells, AWWA A100-15.

PART 2 MATERIALS AND PRODUCTS

Not Used

PART 3 EXECUTION

3.01 DRILLING FLUID BREAKDOWN AND REMOVAL

Upon completion of each production well, the Contractor shall add appropriate chemical dispersing agents (sodium hypochlorite and Johnson Screens NuWell 220 or Engineer-approved equivalent) to facilitate the chemical breakdown and removal of the drilling fluids. The development chemicals shall be applied and removed in accordance with the manufacturer's recommendations. Discharged drilling fluid shall be retained onsite in above ground tanks. Only clean development water will be permitted to be discharged from the drill site during this initial development phase.

3.02 DOUBLE SURGE BLOCK AND PUMPING

- A. The Contractor shall develop the well by the utilization of a double surge block in conjunction with either a dual pipe airlift pumping system or submersible pump. The compressors, air lines, hoses, fittings, etc. or submersible pump shall be of adequate size to continuously lift groundwater from the production well by the airlift principle at $\frac{1}{4}$ to $\frac{1}{2}$ times the design capacity of 250 or 500 gpm for Center South and Well D, respectively. The double surge block shall be attached to the

end of the drill pipe and consist of snug fitting rubber flanged gaskets that are set a minimum of five feet apart. The Contractor shall submit a shop drawing of his double surge block and pumping system to the Engineer for approval prior to installation.

- B. The Contractor shall develop the well by starting from the top of the screen and working uninterrupted toward the bottom of the screened interval. While pumping, the double surge block will be raised and lowered through successive 5- or 10-foot screen intervals to agitate and remove drilling fluids, sand, and other deleterious materials. Swabbing and pumping in this fashion will continue on each screened interval until it is reasonably clean and acceptable to the Engineer. All screened intervals will be continuously swabbed. The Contractor shall be required to perform a second development pass to redevelop specific intervals after the initial development has been completed. After swabbing and pumping is complete, the Contractor shall remove all rock, sand, and foreign material from the bottom of each production well.

3.03 HYDRAULIC JETTING AND PUMPING

With approval of the Engineer, the Contractor may develop the well by simultaneous water jetting and pumping. The Contractor shall submit a shop drawing of the jetting tool to the Engineer for approval prior to installation. The minimum exit velocity of the jetting fluid at the jet nozzle shall be 150 ft/sec. The tool shall be continuously rotated at a speed less than one rpm. The tool shall be pulled upward through the screened interval at rates of no more than 10 minutes per foot. The jetting shall proceed from the bottom of the screen to the top. A second pass through the screened section may be required to complete development. Pumping from the well shall be at a rate of five to 15 percent more than the rate at which water is introduced through the jetting tool. Water used for jetting must contain less than one ppm suspended solids. Jetting in this fashion will continue until sediment levels are acceptable to the Engineer.

3.04 DEVELOPMENT DISCHARGE

The Contractor shall take all necessary precautions to prevent contamination of the water in the well by the introduction of any foreign substance, including contaminated water, gasoline, oil, etc., and shall conform to all laws applicable to the protection of water quality both in the wells and in adjacent waterways. Facilities, equipment, and materials for disposing of the water produced during the development and testing of the wells shall be provided by the Contractor. Following initial drilling fluid removal, water produced during development can be disposed of in the vicinity of each production well. Refer to the figures in Appendix B for additional information. The water shall be discharged in a non-erosive fashion. The Contractor shall provide gated irrigation pipe, boards, tarps, or other means to adequately discharge the water to minimize erosion.

PART 4 MEASUREMENT AND PAYMENT

See Section 01200.

END OF SECTION 02820

SECTION 02830
AQUIFER TESTING

PART 1 GENERAL

1.01 AQUIFER TESTING

Upon completion of all development activities, the Contractor shall perform stepped and constant-rate production tests on each production well. In the event the well does not yield a significant quantity of groundwater during well development, the City and Engineer are not obligated to authorize the aquifer testing phase of this contract for the well. The Engineer will coordinate aquifer testing with the Contractor and determine the duration of each step or test. The Engineer will provide personnel and equipment to monitor water levels and discharge, and collect data during both the stepped and constant-rate tests. The Engineer will employ the services of the Contractor as well for data collection purposes during aquifer testing at no additional charge. The Contractor shall supply the pump, generator, flowmeters with totalizer or alternate Engineer-approved flow gaging apparatus, and all necessary appurtenances.

1.02 SCHEDULE

The Contractor shall proceed with testing the well expeditiously. Within seven calendar days from the completion of all development activities with the drill rig at the drill site, the Contractor shall have mobilized and installed his test pumping equipment within each completed production well. If he believes it is warranted based on conditions encountered during development with the drill rig, the Contractor may submit a written alternate schedule with appropriate justification for approval by the Engineer. If approved, the Contractor shall provide a revised written schedule for final approval by the Engineer. In any event, the Contractor shall install an appropriate test pump and all appurtenant equipment, certify its proper operation, and provide the Engineer and City 48-hour notice prior to commencing aquifer testing. Testing shall not commence without the Engineer onsite.

1.03 RELATED SECTIONS

Section 01010 – Summary of Work
Section 01320 – Submittals
Section 02800 – Production Well Drilling and Construction
Section 02820 – Well Development

PART 2 MATERIALS AND PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The Contractor shall furnish all necessary materials, supplies, equipment, labor, power, fuel and transportation to perform aquifer testing and flow metering, including the following:
1. Mobilize and demobilize equipment and crew.
 2. Supply test pump, and all associated appurtenances, and equipment to conduct testing.

3. Clean and disinfect pump and line prior to placement into well. Install and remove pump.
4. The Contractor shall install a test pump, column pipe, etc. in the production well casing upon completion of all development activities. The test pumping equipment shall be capable of yielding up to 400 gpm at Center South and 800 gpm at Well D. The Contractor shall install the test pump to a depth of no more than two feet above the bottom of the well or alternate Engineer-determined depth.
5. The Contractor shall install a 1-inch I.D. PVC sounding tube along the pump column pipe such that the Engineer can acquire accurate depth to water measurements during all testing.
6. Establish a power source, including an appropriately sized electrical generator, wiring and cable, control and breaker box, and pump panel. The Contractor shall provide a means for safe refueling during operations to prevent even brief shutdowns during the testing procedure. Power shutdowns prior to the end of the testing procedure in excess of one percent of the total time anticipated for the test will require the Contractor to allow the water level to recover to pre-pumping conditions and initiate the test again. Therefore, it is recommended the Contractor maintain a backup generator onsite.
7. Install and remove discharge manifold. The discharge manifold used with the pump shall be of steel construction, and shall include a factory calibrated direct-reading and totalizing flow meter, a sand tester, two 0.75-inch ports for water sampling and a pressure gauge, and a downstream Contractor-supplied flow control valve. The Contractor shall provide calibration records for the flow meter in his submittals prior to its installation in the discharge manifold, which indicate the meter has been calibrated within the last six months prior to the test date. Orifice plates may be used for monitoring pumping rates.
8. The Contractor shall be prepared to accommodate the placement and recovery of a pressure transducer within the well. The Engineer supplied pressure transducer will be installed through the sounding tube. This transducer will be used to remotely collect data on well drawdown.
9. The Contractor shall provide all materials, labor, equipment, supplies, and personnel to install up to 500 feet of discharge piping as necessary to convey discharged water to the Engineer-approved discharge point. It is anticipated that groundwater will be discharged to the locations identified on the figures in Appendix B. Minimal impacts to the environment, roadways, or other existing conditions shall be made. The Contractor shall provide gated irrigation pipe, plywood, or other Engineer-approved materials to minimize impacts to the site. Before assembly in the field, the Contractor and the Engineer shall field verify pipeline locations and discharge points. Groundwater will be discharged under the appropriate Colorado Department of Public Health and Environment policy.

PART 3 EXECUTION

3.01 TEST PUMPING

- A. Following completion of development operations, the aquifer tapped by the wells shall be allowed to recover for at least 24 hours, or for a duration determined by the Engineer prior to starting the pumping tests. The Contractor shall complete the pumping tests with a line-shaft turbine or submersible electric pump capable of producing up to 400 gpm at Center South and 800 gpm at Well D. The Contractor shall install the test pump to a depth of no more than 2 feet above the bottom of the well, or alternate Engineer-determined depth.
- B. The test pumping of the irrigation wells will consist of both stepped and constant-rate aquifer tests. Methods of aquifer testing include: (1) step tests lasting up to 10 hours, which will consist of pumping each discharge rate for approximately 60 to 90 minutes at rates ranging from approximately 100 gpm to the maximum capability of the pump or well; (2) the wells will be allowed to recover overnight or for an adequate period of time as determined by the Engineer; and (3) constant-rate pumping tests lasting up to 24 hours.
- C. The Engineer shall install a pressure transducer and cable into each production well through the 1-inch PVC sounding tube. This transducer will be used to remotely collect data on well drawdown.

3.02 STEPPED RATE TESTS

- A. The purpose of the step tests on the Well D and Center South wells is to determine the optimum rate of discharge for the constant-rate test. Monitoring of the water level, discharge, and line pressure shall be done during each step of the test at logarithmic time intervals and each step shall continue until a distinct change in the rate of drawdown or discharge occurs or shall be discontinued at the Engineer's direction. It may be anticipated that the rate of discharge will start at 100 gpm and be increased up to six times during the tests as water is available and depending upon the design yield of the well. The step test will be conducted over one day and will likely take place over an approximately 10-hour period.
- B. The Engineer will be onsite throughout the stepped rate tests to record water levels and discharge rates. Contractor personnel shall be continually present to attend pumping equipment and assist in data collection.
- C. Following the step tests, the Engineer will monitor water level or pressure recovery at logarithmic time intervals until the water level has recovered to 98 percent of its original static water level. The Contractor will not be compensated for stand-by or down time during the monitoring of recovery. The Contractor need not be onsite during the recovery monitoring period.

3.03 CONSTANT-RATE TEST

- A. Following the step test recovery, Well D and Center South will be tested continuously at a constant rate for a period up to 24 hours. For the purposes of this bid, the Contractor should assume that constant-rate test will be conducted at a pumping rate of 500 gpm for Well D and 250 gpm for Center South. The rates will be determined by the Engineer based on stepped rate test data, and the duration may be shortened or extended at the Engineer's discretion. Discharge shall be

checked and adjusted, if necessary, every 5 minutes during the first hour of operation and at no other time thereafter unless directed by the Engineer. Water levels shall be monitored at logarithmic time intervals during the test.

- B. The Engineer will be onsite during the constant rate and recovery tests to record water levels and discharge rates. Contractor personnel shall be continually present to attend pumping equipment and assist in data collection.
- C. Following the constant discharge tests, the Engineer will monitor well recovery until the well has recovered to 98 percent of its original static water level. Water levels will be monitored at logarithmic time intervals. The Contractor need not be onsite during the recovery monitoring period. The Contractor will be allowed to remove his pumping equipment from the production well after the Engineer has terminated the collection of recovery water level data.

PART 4 MEASUREMENT AND PAYMENT

See Section 01200.

END OF SECTION 02830

SECTION 02840

DISINFECTION

PART 1 GENERAL

1.01 DISINFECTION

The Contractor shall disinfect each production well in accordance with the AWWA Standard for Disinfection of Wells, C654. The well shall be disinfected to remove bacteriological contamination. All equipment, tools, and camera shall be disinfected prior to commencement of work and between holes.

1.02 RELATED SECTIONS

Section 02800 – Production Well Drilling and Construction

1.03 REFERENCES

AWWA Standard for Disinfection of Wells: C654

PART 2 MATERIALS AND PRODUCTS

Not Used

PART 3 EXECUTION

3.01 DISINFECTION

Prior to commencement of work at the drill site, the Contractor shall wash all bits, tools and probes in a concentrated sodium hypochlorite solution to the satisfaction of the Engineer.

Following completion of all aquifer testing work, the Contractor shall disinfect the production wells by a solution of high-test calcium hypochlorite or sodium hypochlorite sufficient to establish a concentration of 500 ppm throughout the well bore. The Contractor shall apply this solution by a method that will insure 24 hours of contact throughout the water column inside the well casing. The well casing and drop pipe shall be sprayed during installation with a 100 ppm chlorine solution.

3.02 OVERDOSING REQUIREMENT

- A. At the conclusion of the 24-hour contact time, three casing volumes of water will be evacuated from the well and a sample will be collected by the Contractor for bacteriological testing. The Contractor shall also monitor total residual chlorine concentrations in the discharge water. Temporary discharges involving chlorinated water will require a non-detectable concentration of total residual chlorine prior to discharge. The Engineer considers the analytical detection limit for total residual chlorine to be 0.02 mg/L. Any sample results less than 0.02 mg/L will be considered non-detectable. The Contractor shall detain and treat any groundwater discharged with a total chlorine residual over 0.02 mg/L, prior to discharge.
- B. Samples collected for bacteriological testing shall be delivered to a testing facility within 24 hours of sampling. The Contractor shall be responsible for the testing fees.

- C. If the samples collected after disinfection show bacteriological contamination, the Contractor shall prepare and apply to the entire depth of the well a total volume of the chlorine solution of at least 100 mg/L of available chlorine equal to at least four times the volume of water in the well. The Contractor shall allow this solution to remain in the well for a period of at least 24 hours. The bacteriological testing procedure will be repeated at the Contractor's expense.

PART 4 MEASUREMENT AND PAYMENT

See Section 01200.

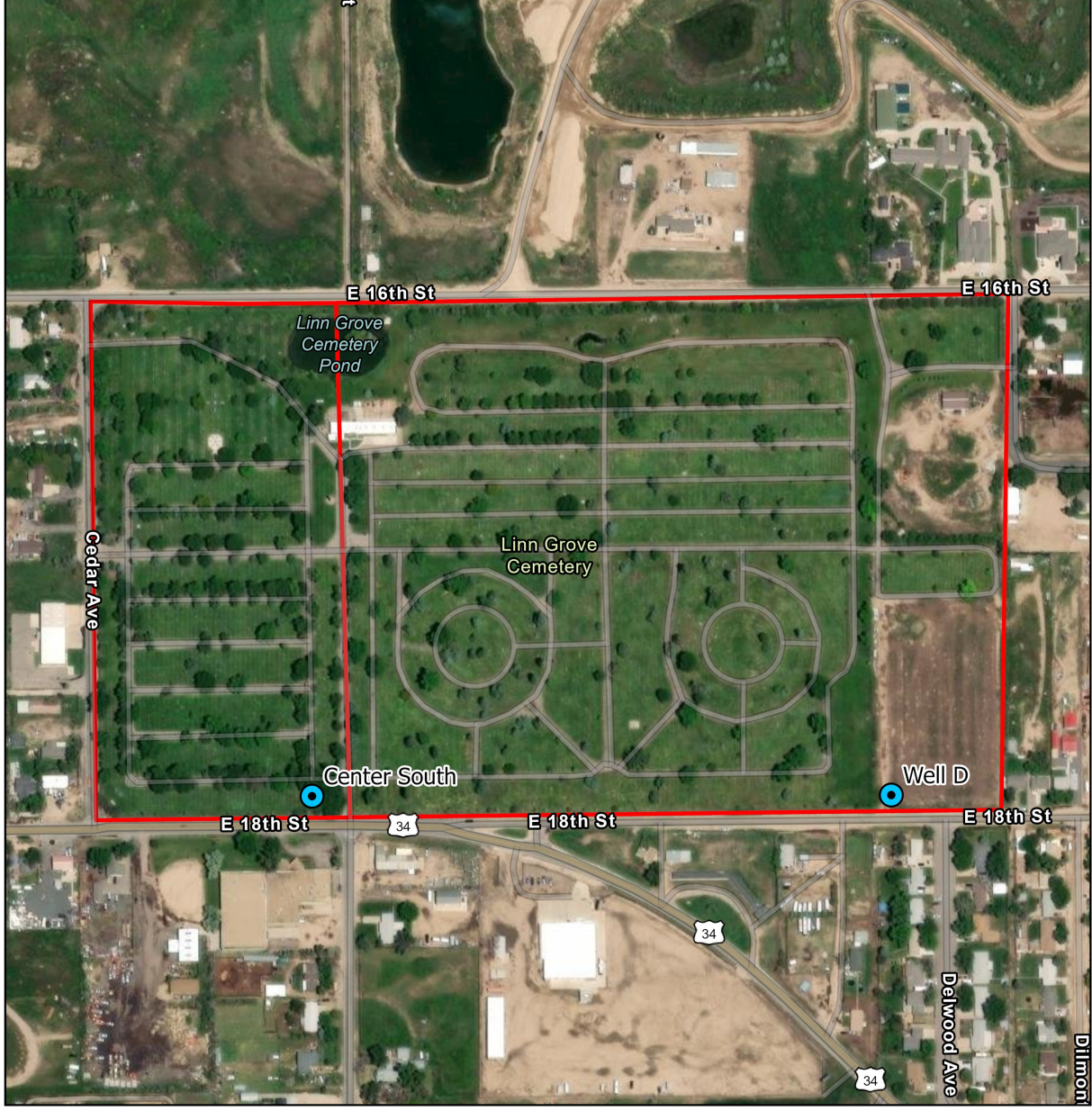
END OF SECTION 02840

APPENDIX A

Figure 1. Proposed Production Well Locations

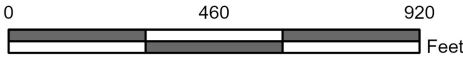


UN1813017531HydrogeologyWell_DesignLinnGroveWell_LinnGrove.aprx Revised: 2024-05-20 By: kwoodford



Legend

- ▭ Linn Grove Cemetery Parcel
- Proposed Irrigation Well Locations



(At original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM 13N
2. Data Sources: ESRI, Stantec, City of Greeley



Stantec

Project Location Prepared by KWW on 2024-05-10
 T5N, R65W, S09 and T5N, R65W, S10
 Greeley, CO

Client/Project
 City of Greeley
 Linn Grove Well Replacement 181301753

Figure No.
1

Title
Proposed Production Well Locations

APPENDIX B

Figures:
Center South Well
Well D





Irrigation System Hydrant

1 acre w/perimeter trench by others

350-ft

Well D

Point of Discharge

E 18th St

Delwood Ave

Dimmet Ave

1550

1803

1805

1800

1801

1769

1789

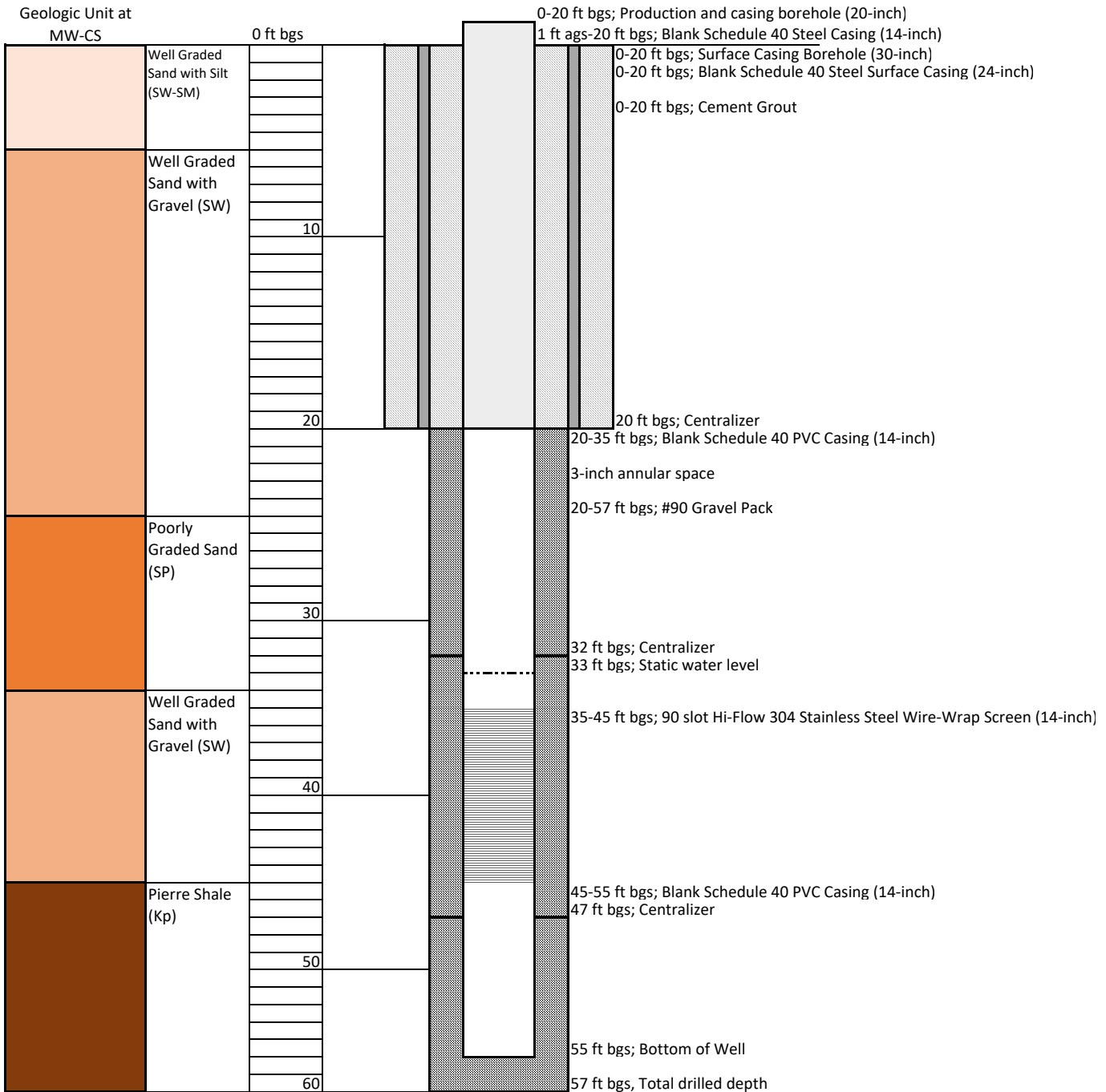
APPENDIX C

Figures:
Center South Well 6-3-2024
Well D 6-3-2024



Approximate Coordinates	
Easting	--
Northing	--
Elevation (ft amsl)	--

Center South Replacement Well



Material	Nominal Diameter	Interval
Surface Casing Borehole	36 inches	0 - 20 ft bgs
Borehole	20 inches	20 - 57 ft bgs
Blank Steel Surface Casing	24 inches	0 - 20 ft bgs
Blank Steel Well Casing	14 inches	1 ft ags - 20 ft bgs
0.09-inch Slotted Steel Screen	14 inches	35 - 45 ft bgs
Blank PVC Casing	14 inches	20 - 35 ft bgs, 45 - 55 ft bgs

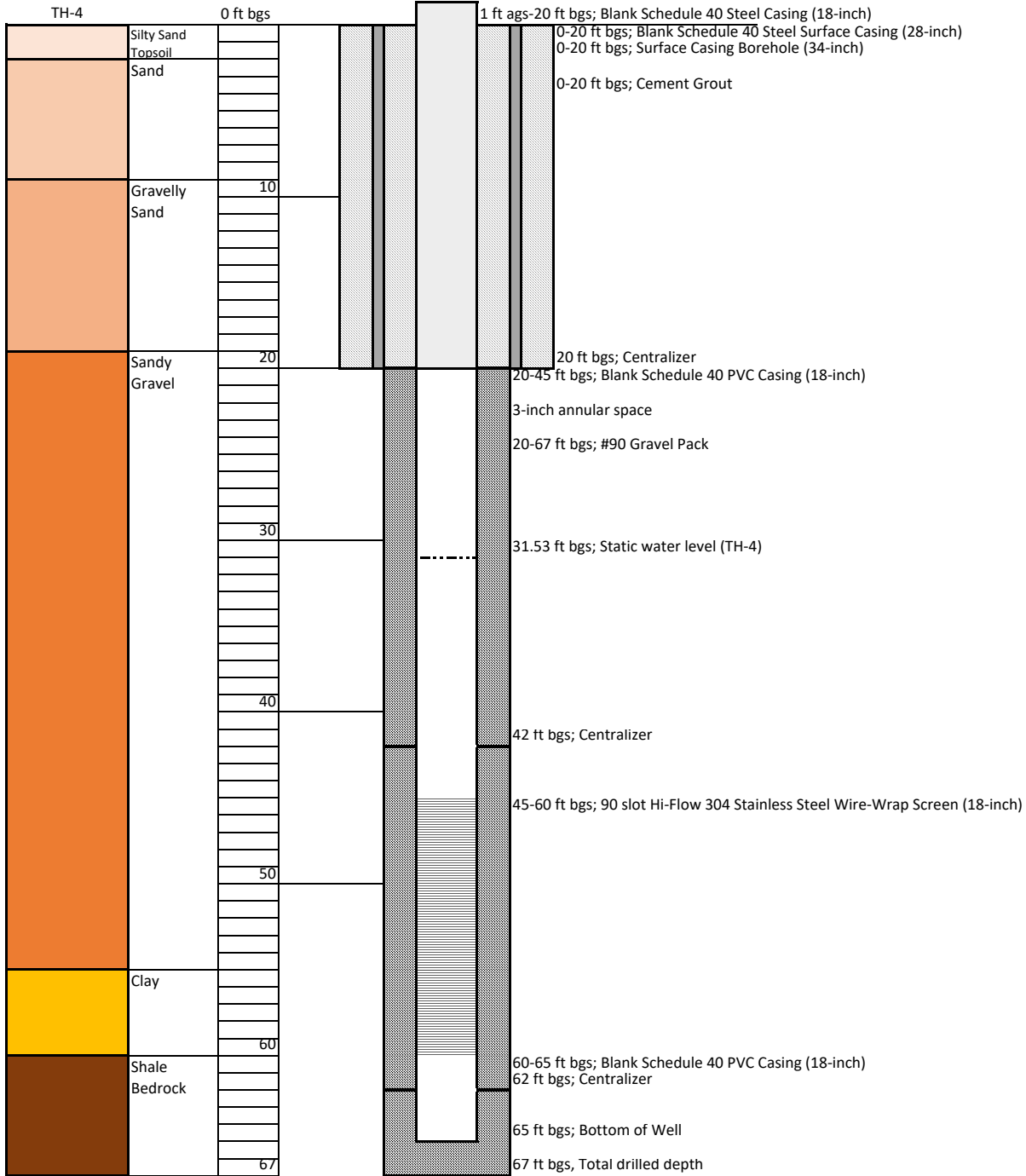
* Centralizers at 20, 32, and 47 ft bgs.

	Cement Grout
	Blank Schedule 40 Steel Surface Casing (24-inch)
	Blank Schedule 40 Steel Casing (14-inch)
	Blank Schedule 40 PVC Casing (14-inch)
	#90 Gravel Pack (Red Flint)
	90 slot Hi-Flow 304 Stainless Steel Wire-Wrap Screen (Johnson Screens) (14-inch)

Approximate Coordinates	
Easting	--
Northing	--
Elevation (ft amsl)	--

Well D

Geologic Units at TH-4



Material	Nominal Diameter	Interval
Surface Casing Borehole	34 inches	0 - 20 ft bgs
Borehole	24 inches	20 - 67 ft bgs
Blank Steel Surface Casing	28 inches	0 - 20 ft bgs
Blank Steel Well Casing	18 inches	1 ft ags - 20 ft bgs
0.090-inch Slotted Steel Screen	18 inches	45 - 60 ft bgs
Blank PVC Casing	18 inches	20 - 45 ft bgs, 60 - 65 ft bgs

* Centralizers at 20, 42, and 62 ft bgs.

Cement Grout
Blank Schedule 40 Steel Surface Casing (28-inch)
Blank Schedule 40 Steel Casing (18-inch)
Blank Schedule 40 PVC Casing (18-inch)
#90 Gravel Pack (Red Flint)
90 slot Hi-Flow 304 Stainless Steel Wire-Wrap Screen (18-inch) (Johnson Screens)

Diagram not to scale.

APPENDIX D

Figures:
MW-CS
TH-4



PROJECT: Linn Grove Cemetary Well Replacement
LOCATION: S-SW of property
PROJECT NUMBER: 181301611

WELL/BOREHOLE NO: MW-Center South

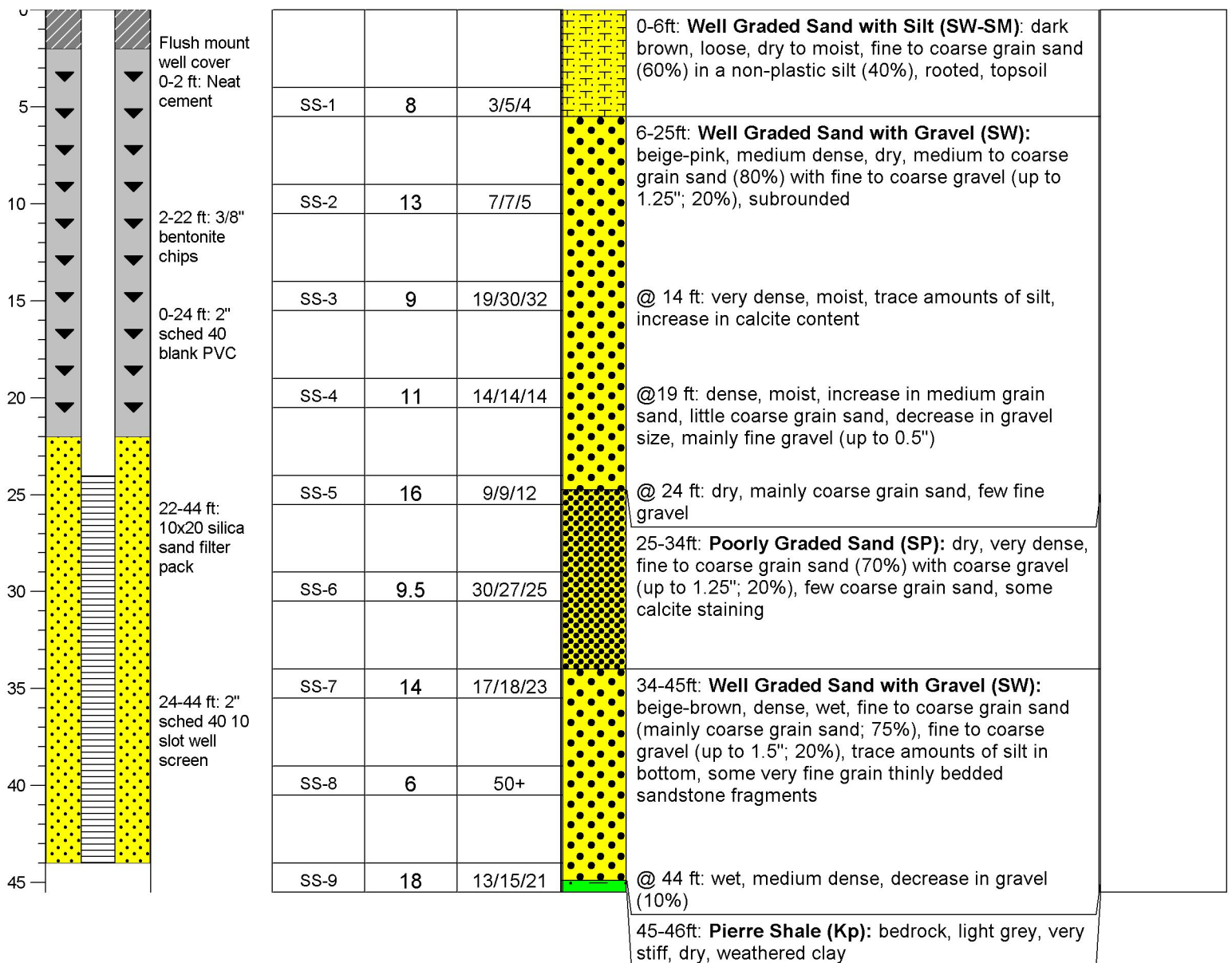


DRILLING: STARTED 4-19-23 COMPLETED 4-19-23
INSTALLATION: STARTED 4-17-23 COMPLETED 4-19-23
DRILLING COMPANY: Terracon
DRILLING EQUIPMENT: CME 75
DRILLING METHOD: HSA
SAMPLING EQUIPMENT: Split Spoon

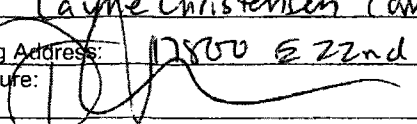
LATITUDE: 40.41031
GROUND ELEV (ft): 4652'
INITIAL DTW (ft): 33
STATIC DTW (ft): 32.61
WELL CASING DIAM (in): 2"
LOGGED BY: FT

LONGITUDE: -104.659122
TOC ELEV (ft): 4652'
DEPTH (ft): 44
WELL DEPTH (ft): 44
BOREHOLE DIAM (in): 8.25"
CHECKED BY: MS

Depth (feet)	Well Construction	Sample	Measured Recovery (in)	Blow Count	Lithology	Comments
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Notes: This figure presents the as-drilled details for MW-Center South drilled at the Linn Grove Cemetary located in Greeley, CO in the NESE quarter of Section 9 in T5N R65W. This borehole was drilled by Terracon of Fort Collins, CO using hollow stem auger drilling methods. This well was drilled to monitor water levels in a pre-existing well. Sediment samples were collected during drilling and sent to Johnson Screens for gradation analysis. This data will be used to design potential replacement wells.

FORM NO. GWS-31 04/2005	WELL CONSTRUCTION AND TEST REPORT STATE OF COLORADO, OFFICE OF THE STATE ENGINEER 1313 Sherman St., Room 818, Denver, CO 80203 Phone - Info (303) 866-3587 Main (303) 866-3581 Fax (303) 866-3589 http://www.water.state.co.us	For Office Use Only RECEIVED JUL 22 2010 WATER RESOURCES STATE ENGINEER COLO							
1. WELL PERMIT NUMBER: 283058									
2. WELL OWNER INFORMATION NAME OF WELL OWNER: <u>CITY OF GREELEY C/O LIOSTONE & ASSOCIATES</u> MAILING ADDRESS: <u>4025 AUTOMATION WAY BLDG E</u> CITY: <u>FORT COLLINS</u> STATE: <u>CO</u> ZIP CODE: <u>80525</u> TELEPHONE NUMBER: <u>(970) 223-4705</u>									
3. WELL LOCATION AS DRILLED: <u>NE 1/4, SW 1/4, Sec. 10, Twp. 5</u> <input checked="" type="checkbox"/> N or <input type="checkbox"/> S, Range <u>65</u> <input type="checkbox"/> E or <input checked="" type="checkbox"/> W DISTANCES FROM SEC. LINES: <u>1414</u> ft. from <input type="checkbox"/> N or <input checked="" type="checkbox"/> S section line and <u>1334</u> ft. from <input type="checkbox"/> E or <input checked="" type="checkbox"/> W section line. SUBDIVISION: _____, LOT _____, BLOCK _____, FILING (UNIT) _____ Optional GPS Location: GPS Unit must use the following settings: Format must be UTM, Units must be meters, Datum must be NAD83, Unit must be set to true N, <input type="checkbox"/> Zone 12 or <input type="checkbox"/> Zone 13 STREET ADDRESS AT WELL LOCATION: _____ Northing: _____ Owner's Well Designation: <u>TH-4</u> Easting: _____									
4. GROUND SURFACE ELEVATION _____ feet DRILLING METHOD <u>Hollow Stem Auger</u> DATE COMPLETED <u>6/4/10</u> TOTAL DEPTH <u>60.5</u> feet DEPTH COMPLETED <u>56</u> feet									
5. GEOLOGIC LOG:					6. HOLE DIAM (in.)				
Depth	Type	Grain Size	Color	Water Loc.	From (ft)	To (ft)			
0-2	Topsoil	silty sand	dk brown		8.25	0	59		
2-9	Sand	sand	orange/brn						
9-19	Gravelly Sand	sand	orange/brn						
19-56	Sandy Gravel	gravel	orange/brn	Yes					
56-59.5	Clay	clay	tan						
59.5-60.5	Bedrock	shale	gray						
					7. PLAIN CASING:				
					OD (in)	Kind	Wall Size (in)	From (ft)	To (ft)
					2	PVC	Sch. 40	0	36
					PERFORATED CASING: Screen Slot Size (in): <u>0.020</u>				
					2	PVC	Sch. 40	36	56
					8. FILTER PACK:				
					Material	<u>Sand</u>			
					Size	<u>10X20</u>			
					Interval	<u>31-57 ft.</u>			
					9. PACKER PLACEMENT:				
					Type	_____			
					Depth	_____			
					10. GROUTING RECORD				
					Material	Amount	Density	Interval	Placement
					Bentoni	17 bags		1-31 ft.	
					Cement	1 bag		0-1 ft.	
					Bentoni	1 bag		57-60.5 ft	
Remarks: _____									
11. DISINFECTION: Type _____ Amt. Used _____									
12. WELL TEST DATA: <input type="checkbox"/> Check box if Test Data is submitted on Form Number GWS 39 Supplemental Well Test.									
TESTING METHOD _____									
Static Level <u>28.98</u> ft. Date/Time measured: <u>6/2/2010; 13:18</u> Production Rate _____ gpm. Pumping Level _____ ft. Date/Time measured _____ Test Length (hrs) _____									
Remarks: _____									
13. I have read the statements made herein and know the contents thereof, and they are true to my knowledge. This document is signed and certified in accordance with Rule 17.4 of the Water Well Construction Rules, 2 CCR 402-2. [The filing of a document that contains false statements is a violation of section 37-91-108(1)(e), C.R.S., and is punishable by fines up to \$5000 and/or revocation of the contracting license.]									
Company Name: <u>Layne Christensen Company</u>					Phone: <u>(313) 755-1281</u>			License Number: <u>1200</u>	
Mailing Address: <u>12800 E 22nd Ave, Aurora, CO 80011</u>									
Signature: 					Print Name and Title: <u>David A. TORMOEHLEN</u>			Date: <u>7/21/10</u>	