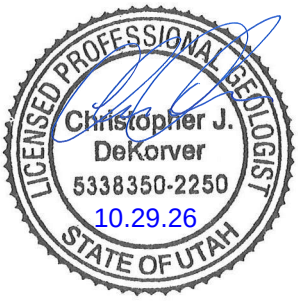
CONSTRUCTION DOCUMENTS FOR THE IRRIGATION WELL 9 PROJECT

CONSULTANT PROJECT NO.: 305-26-01
U3P EVENT NO: 2026-016

October 2026

OWNER
CITY OF SARATOGA SPRINGS

SARATOGA SPRINGS
Life's just better here



ENGINEER

BOWEN COLLINS & ASSOCIATES

Bids shall be submitted digitally through the Utah Public Procurement (UP3) platform via Euna Procurement, formerly known as Bonfire, by 1:00 pm on November 19, 2026. Bids will be read virtually at 2:00 pm on November 19, 2026.

Any communication regarding this RFB to any elected or appointed official of the City or any other City staff, unless said communication is required by the primary contact, shall result in the disqualification of the proposal. Questions are posed electronically through the U3P.

Issue Date:	October 30, 2026
Pre-Bid Meeting/Site Visit:	November 3, 2206 – 11:00 am
Closing Date:	November 19, 2026, 1:00 pm
Bid Opening:	November 19, 2026, 2:00 pm
Anticipated Award Date:	December 9, 2026
Anticipated Completion:	Summer 2027

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SECTION 00 11 13
ADVERTISEMENT FOR BIDS

CITY OF SARATOGA SPRINGS
IRRIGATION WELL 9

ADVERTISEMENT FOR BIDS

Bids

Bids for the construction of **Irrigation Well 9** will be received digitally by Thursday, November 19, 2026 at 1:00 PM from prequalified bidders only through the Utah Public Procurement Place/Euna Procurement (U3P). The Bids received will be "publicly" opened and read at 2:00 PM on November 19, 2026. Any Bids received after the specified timeline will not be considered. If you wish to be invited to the Zoom meeting where the bids will be read please email HParkin@saratogasprings-ut.gov .

Bids will be received for a single prime contract. Bids shall be on a lump sum and unit price basis, with additive alternate bid items as indicated in the Bid Form. Instructions regarding requirements for bid security are included in the Instructions to Bidders.

Obtaining Contract Documents

The Issuing Office for the Bidding Documents is the Utah Public Procurement Place/Euna (U3P) website. The Contract Documents are titled **Documents for the Irrigation Well 9 Project**. Digital copies (pdf) of Bidding Documents may be examined at no cost through the Utah Public Procurement Place (U3P) website. https://utah.bonfirehub.com/portal/?tab=openOpportunities

Description of Work

The Project includes the drilling, construction, and testing of a new irrigation well (Irrigation Well 9). The well will be drilled using the flooded reverse mud rotary drilling method to an approximate depth of 1200 feet deep. Anticipated at 20-inch diameter well casing and engineered gravel pack. The project will include rig development, pump development and testing, final video and disinfection. The well is expected to be completed in summer 2027.

Work Location

The Irrigation Well 9 site is located in Saratoga Springs, immediately south of the Saratoga Springs Fire Department building at approximately 2021 Ring Road, Saratoga Springs, UT 84045.

Pre-bid Conference

A mandatory pre-bid conference will be held on site on **Tuesday, November 3, 2026, at 11:00 AM** at the Saratoga Springs Public Works office located at 213 N 900 E, Saratoga Springs, UT 84045. A site visit to the project site will follow the pre-bid conference.

Completion of Work

All Work shall be completed by **July 15, 2027**. Time is of the essence.

Owner: **City of Saratoga Springs**

By: **Jeremy Lapin, PE**

Title: **Public Works Director**

Date: **October 26, 2026**

+ + END OF ADVERTISEMENT FOR BIDS + +

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

ARTICLE 1 – DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered. For the purpose of this document, the issuing office is Utah Public Procurement Place/Euna (U3P). https://utah.bonfirehub.com/portal/?tab=openOpportunities

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents may be obtained from the Utah Public Procurement Place/Euna (U3P) website as stated in the advertisement or invitation to bid.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit information regarding valid State of Utah licensure, experience, organization, personnel, and equipment required by the Bidding Documents. Additional information such as financial data, previous experience, and present commitments, and such information that may be required to confirm qualifications and competence to perform the Work may be also requested by the Owner.

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:

a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.

b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.

B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing

so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

A. Examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. Visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. Become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. Carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

E. Consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

F. Agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

I. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

J. Agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

6.01 A pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted through Euna's (U3P) questions and answers page located on the website and will be answered publicly. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered through the website and/or by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the

Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

9.01 The number of days within which, or the dates by which the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

12.03 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for use on the project.

If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.

13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

13.04 A Bid by an individual shall show the Bidder's name and official address.

13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

13.06 All names shall be printed in ink below the signatures.

13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

14.02 *Allowances*

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.

15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED."

15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

15.04 The City of Saratoga Springs will be accepting online submittals only through Utah Public Procurement Place (U3P) platform via Euna Procurement (formerly known as Bonfire). To respond to this solicitation, register at the new U3P Euna Procurement platform. For first-time users, click "Register" and complete the registration process before reviewing and responding to the solicitation. For registration assistance, consult the online knowledge base, explore the FAQs, or contact the Bonfire Support Team at support@gobonfire.com.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the

date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.

19.03 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

C. Bid prices will be compared after adjusting for differences in time of Substantial Completion (total number of calendar days to substantially complete the Work) designated by Bidders. The adjusting amount will be determined at the rate set forth in the Agreement for liquidated damages for failing to achieve Substantial Completion, or such other amount that Owner has designated in the Bid Form.

1. The method for calculating the lowest bid for comparison will be the summation of the Bid price shown in the Bid Form plus the product of the Bidder-specified time of Substantial Completion (in calendar days) times the rate for liquidated damages (in dollars per day).

2. This procedure is only used to determine the lowest bid for comparison and contractor selection purposes. The Contract Price for compensation and payment purposes remains the Bid price shown in the Bid Form.

19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 It is customary for Owner to fill in the date on the signature page of the Agreement in order to indicate when it is to become effective (the Effective Date of the Contract) so that the required bonds may be properly dated. When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

SECTION 00 41 00

BID FORM

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Submit all bids electronically through the U3P Platform (Euna Procurement)
https://utah.bonfirehub.com/portal/?tab=openOpportunities

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	Addendum, Date
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the e execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID

A. **BID ITEM A: IRRIGATION WELL 9 BASE BID**

Item No.	Specification Reference Number Classification of Unit Price Work	Unit	Estimated Quantity	Unit Price	Amount
A1	Section 33 11 15 Mobilization/Demobilization/Cleanup	lump sum	1	$	$
A2	Section 33 11 15 Sound Control	linear feet	200	$	$
A3a	Section 33 11 20 Minimum 40-inch Diameter, 0.375-inch wall, Steel Conductor Casing and Seal in a 46-inch minimum diameter borehole. Note: (minimum depth of 40 feet)	lump sum	1	$	$
A3b	Section 33 11 20 Minimum 32-inch Diameter, 0.375-inch wall, Steel Conductor Casing and Certified Seal in a 38-inch minimum diameter borehole. (Note: minimum depth of 150 feet)	lump sum	1	$	$
A4a	Section 33 11 35 13 to 17.5-inch Pilot Borehole Drilling (Note: 150 to 1,200 feet)	linear feet	1,050	$	$
A4b	Section 33 11 35 28-inch Production Borehole Drilling (Reaming) (Note: 150 to 1,200 feet)	linear feet	1,050	$	$
A5	Section 33 11 40 Geophysical Logging	lump sum	1	$	$

A6	Section 33 11 46 Caliper Survey	each	2	$	$
A7	Section 33 11 47 Formation Water Zone Testing/Sampling	each	3	$	$
A8	Section 33 11 47 Additional Zone Development Time	hour	16	$	$
A9	Section 33 11 50 Well Installation – 20” Low-Carbon Steel (LCS) Casing, 0.375-inch wall	linear feet	803	$	$
A10	Section 33 11 50 Well Installation – 20” Well Screen, 100 Slot, Low-Carbon Steel, Ful-Flo Louvered	linear feet	400	$	$
A11	Section 33 11 52 Gravel Pack Installation – ¼ x ⅛ Gradation	linear feet	1,100	$	$
A12	Section 33 11 52 Furnish 12% Sodium Hypochlorite (1,500 ppm)	gallons	450	$	$
A13	Section 33 11 60 Initial Well Development with Rotary Drill Rig	hour	200	$	$
A14	Section 33 11 60 Furnish 12% Sodium Hypochlorite (1,500 ppm)	gallons	200	$	$
A15	Section 33 11 60 Furnish NW-220 Treatment	gallons	25	$	$
A16	Section 33 11 60 Mix/Prepare Chlorine and NW-220 Treatment	lump sump	1	$	$
A17	Section 33 11 60 Inject/Swab Chlorine and NW-220 Treatment with Swab Tool	hour	12	$	$
A18	Section 33 11 62 Install Pump for Development and Testing	lump sum	1	$	$

A19	Section 33 11 64 Well Development by Pumping	hour	126	$	$
A20	Section 33 11 66 Step-Rate Drawdown Test	hour	10	$	$
A21	Section 33 11 68 Constant-Rate Discharge Test	hour	24	$	$
A22	Section 33 11 70 Video Camera Survey	lump sum	1	$	$
A23	Section 33 11 72 Plumbness and Alignment Testing	lump sum	1	$	$
A24	Section 33 11 80 Disinfecting	lump sum	1	$	$
A25	Section 33 11 82 Well Head	lump sum	1	$	$
A26	Section 33 11 84 Well Capping	lump sum	1	$	$
A27	Section 33 11 95 Drilling Fluids and Pumped Water Disposal	10,000 gallons	50	$	$
A28	Section 33 11 95 Drilling Cuttings Disposal	Cubic Yard	350	$	$

Bid Schedule A Total = $ _____

Bid Schedule A Total In Words:

_____

B. **BID ITEM B: ADDITIVE ALTERNATE - HSLA CASING AND SCREEN**

B1	*Alternate – Do not include in total:* Well Installation – 20" High Strength Low Alloy (HSLA) Casing, 0.375-inch wall	linear feet	803	$	$
B2	*Alternate – Do not include in total:* Well Installation – 20" Well Screen, 100 Slot, High Strength Low Alloy (HSLA), 0.375-inch wall, Ful-Flo Louvered	linear feet	400	$	$

Bid Schedule B Total = $ _____

Bid Schedule B Total In Words:

_____

B. **BID ITEM C: ADDITIVE ALTERNATE - 304L STAINELSS STEEL CASING AND SCREEN**

C1	*Alternate – Do not include in total:* Well Installation – 20" 304L Stainless-Steel (SST) Casing, 0.3125-inch wall	linear feet	603	$	$
C1	*Alternate – Do not include in total:* Well Installation – 20" 304L Stainless-Steel (SST) Casing, 0.375-inch wall	linear feet	200	$	$
C3	*Alternate – Do not include in total:* Well Installation – 20" Well Screen, 100 Slot, 316 Stainless Steel, 0.375-inch wall, Ful-Flo Louvered	linear feet	400	$	$

Bid Schedule C Total = $ _____

Bid Schedule C Total In Words:

_____

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. Contractor's Current Business License Information;

C. Contractor's License No.: _____

D. List of Proposed Subcontractors;

E. List of Proposed Suppliers;

F. List of Project References;

G. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;

H. Signing Authority;

I. Safety Plan(s), as requested.

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

END OF SECTION

SECTION 00 43 13

BID BOND

BID BOND (PENAL SUM FORM)

Bidder Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Owner Name: **City of Saratoga Springs** Address *(principal place of business)*: **Saratoga Springs Department of Public Works** **213 N 900 E** **Saratoga Springs, UT 84045**	**Bid** Project *(name and location)*: **Irrigation Well 9 Project** Bid Due Date: **November 19, 2026**
Bond Penal Sum: Date of Bond:	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
    3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
    3.2. All Bids are rejected by Owner, or
    3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00 45 16
LIST OF SUBCONTRACTORS

The bidder shall list below the names and business address of each subcontractor who will perform Work under this Contract in excess of five percent (0.05) of the total bid price and shall also list the portion of the work which will be done by such subcontractor. After the opening of proposals, no changes or substitutions will be allowed without the written approval of the Owner. NOTE: Attach additional sheets if required.

WORK TO BE PERFORMED	SUBCONTRACTOR'S NAME AND ADDRESS
1.	
2.	
3.	
4.	
5.	
6.	

- END OF SECTION -

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SCTION 00 51 00

NOTICE OF AWARD

Date of Issuance:		
Owner:	City of Saratoga Springs	Owner's Project No.:
Engineer:	Bowen Collins & Associates	Engineer's Project No.:
Project:	Irrigation Well 9	
Contract Name:		
Bidder:		
Bidder's Address:		

You are notified that Owner has accepted your Bid dated **[date]** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

The drilling, construction, and testing of a new irrigation well (Irrigation Well 9). The well will be drilled using the flooded reverse mud rotary drilling method to an approximate depth of 1200 feet deep. Anticipated at 20-inch diameter well casing and engineered gravel pack. The project will include rig development, pump development and testing, final video and disinfection. The well is expected to be completed in early 2027.

The Contract Price of the awarded Contract is $**[Contract Price]**. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

[Number of copies sent] unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **[number of copies sent]** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): **[Describe other conditions that require Successful Bidder's compliance]**

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **City of Saratoga Springs**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Engineer

SECTION 00 52 00
AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between the City of Saratoga Springs (“Owner”) and (“Contractor”).

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

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

The Project includes the drilling, construction, and testing of a new irrigation well (Irrigation Well 9). The well will be drilled using the flooded reverse mud rotary drilling method to an approximate depth of 1200 feet deep. Anticipated at 20-inch diameter well casing and engineered gravel pack. The project will include rig development, pump development and testing, final video and disinfection. The well is expected to be completed in early 2027.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Irrigation Well 9 Project.**

ARTICLE 3—ENGINEER

3.01 The Owner will assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by *Bowen Collins & Associates*.

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Dates*

A. The Work will be substantially complete on or before **July 15, 2027** and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **July 15, 2027.**

4.04 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration

proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner **$500** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **$250** for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the 1st day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. **95** percent of the value of the Work completed (with the balance being retainage).

b. **95** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **100** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

A. All amounts not paid when due will bear interest at the rate of **N/A** percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual (copy of list attached).
6. Drawings (not attached but incorporated by reference) with each sheet bearing the following general title: Irrigation Well 9 Project
8. Addenda (numbers ____ to ____ inclusive).
9. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid.
    b. Documentation submitted by Contractor prior to Notice of Award.
10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.

b. Work Change Directives.

c. Change Orders.

d. Field Orders.

e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price,

within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

*(If **Owner** is a corporation, attach evidence of authority to sign. If **Owner** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*

Contractor:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

*(If **Contractor** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

License No.: _____
(where applicable)

State: _____

- END OF SECTION -

SECTION 00 55 00

NOTICE TO PROCEED

Owner:	City of Saratoga Springs	Owner's Project No.:	
Engineer:	Bowen Collins & Associates	Engineer's Project No.:	
Contractor:		Contractor's Project No.:	
Project:	Irrigation Well 9		
Contract Name:			
Effective Date of Contract:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement:

The date by which Substantial Completion must be achieved is **July 15, 2027**, and the date by which readiness for final payment must be achieved is **July 15, 2027.**

Before starting any Work at the Site, Contractor must comply with the following:

Obtain all necessary permits from Saratoga Springs and Utah County and provide required submittals to the Engineer. There are no other restrictions.

Owner:	**City of Saratoga Springs**
By *(signature)*:	
Name *(printed)*:	
Title:	
Date Issued:	

Copy: Engineer

SECTION 00 61 00

PERFORMANCE BOND

Contractor Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	**Surety** Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **City of Saratoga Springs** Mailing address *(principal place of business)*: **319 S Saratoga Road** **Saratoga Springs, UT 84045**	**Contract** Description *(name and location)*: **Irrigation Well 9, Saratoga Springs, UT** Contract Price: **[Amount from Contract]** Effective Date of Contract: **[Date from Contract]**

Bond

Bond Amount: **[Amount]**

Date of Bond: **[Date]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:

    3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;

    3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

    3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

    5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

    5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

    5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

    5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

   7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

   7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

   7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

    14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

    14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

    14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows: **None**

SECTION 00 61 50

PAYMENT BOND

Contractor Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	**Surety** Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **City of Saratoga Springs** Mailing address *(principal place of business)*: **319 S Saratoga Road** **Saratoga Springs, UT 84045**	**Contract** Description *(name and location)*: **Irrigation Well 9, Saratoga Springs, UT** Contract Price: **[Amount, from Contract]** Effective Date of Contract: **[Date, from Contract]**

Bond

Bond Amount: **[Amount]**

Date of Bond: **[Date]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond will arise after the following:

    5.1. Claimants who do not have a direct contract with the Contractor

        5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).

    5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

    7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

    7.2. Pay or arrange for payment of any undisputed amounts.

    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Claim*—A written statement by the Claimant including at a minimum:

        16.1.1. The name of the Claimant;

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

        16.1.4. A brief description of the labor, materials, or equipment furnished;

16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

Contractor's Application for Payment

Owner:		**Owner's Project No.:**	
Engineer:		**Engineer's Project No.:**	
Contractor:		**Contractor's Project No.:**	
Project:			
Contract:			
Application No.:		**Application Date:**	
Application Period:	**From**	**to**	

1. Original Contract Price			$ -
2. Net change by Change Orders			$ -
3. Current Contract Price (Line 1 + Line 2)			$ -
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)			$ -
5. Retainage			
a. _____ X	$ -	Work Completed	$ -
b. _____ X	$ -	Stored Materials	$ -
c. Total Retainage (Line 5.a + Line 5.b)			$ -
6. Amount eligible to date (Line 4 - Line 5.c)			$ -
7. Less previous payments (Line 6 from prior application)			
8. Amount due this application			$ -
9. Balance to finish, including retainage (Line 3 - Line 4)			$ -

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor: _____

Signature: _____ **Date:** _____

Recommended by Engineer	**Approved by Owner**
By:	**By:**
Title:	**Title:**
Date:	**Date:**
Approved by Funding Agency	
By:	**By:**
Title:	**Title:**
Date:	**Date:**

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Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: City of Saratoga Springs
Engineer: Bowen Collins & Associates
Contractor:
Project: Irrigation Well 9
Contract:

Owner's Project No.:
Engineer's Project No.:
Contractor's Project No.:

Application No.: **Application Period:** From to **Application Date:**

A	B	C	D	E	F	G	H	I	J	K	L
		Contract Information				Work Completed					
Bid Item No.	Description	Item Quantity	Units	Unit Price ($)	Value of Bid Item (C X E) ($)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) ($)	Materials Currently Stored (not in G) ($)	Work Completed and Materials Stored to Date (H + I) ($)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) ($)
Original Contract											
					-		-		-		-
					-		-		-		-
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					-		-		-		-
				Original Contract Totals	$ -		$ -	$ -	$ -		$ -

EJCDC C-620 Contractor's Application for Payment
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Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: City of Saratoga Springs
Engineer: Bowen Collins & Associates
Contractor:
Project: Irrigation Well 9
Contract:

Owner's Project No.:
Engineer's Project No.:
Contractor's Project No.:

Application No.: **Application Period:** From to **Application Date:**

A	B	C	D	E	F	G	H	I	J	K	L
		Contract Information				Work Completed					
Bid Item No.	Description	Item Quantity	Units	Unit Price ($)	Value of Bid Item (C X E) ($)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) ($)	Materials Currently Stored (not in G) ($)	Work Completed and Materials Stored to Date (H + I) ($)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) ($)
Change Orders											
					-		-		-		-
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					-		-		-		-
				Change Order Totals	$ -		$ -	$ -	$ -		$ -
Original Contract and Change Orders											
				Project Totals	$ -		$ -	$ -	$ -		$ -

EJCDC C-620 Contractor's Application for Payment
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SECTION 00 62 50

CERTIFICATION OF SUBSTANTIAL COMPLETION

Owner:	City of Saratoga Springs	Owner's Project No.:
Engineer:	Bowen Collins & Associates	Engineer's Project No.:
Contractor:		Contractor's Project No.:
Project:	Irrigation Well 9	
Contract Name:		

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and 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.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

SECTION 00 63 41

CHANGE ORDER FORM

CHANGE ORDER NO.: [Number of Change Order]

Owner:	City of Saratoga Springs	Owner's Project No.:
Engineer:	Bowen Collins & Associates	Engineer's Project No.:
Contractor:		Contractor's Project No.:
Project:	Irrigation Well 9	
Contract Name:		
Date Issued:		Effective Date of Change Order:

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	**Change in Contract Times [State Contract Times as either a specific date or a number of days]**
Original Contract Price: $ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. **[Number of previous Change Order]**: $ _____	**[Increase] [Decrease]** from previously approved Change Orders No.1 to No. **[Number of previous Change Order]**: Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: $ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: $ _____	**[Increase] [Decrease]** this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: $ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

	Recommended by Engineer (if required)	Authorized by Owner
By:	_____	_____
Title:	_____	_____
Date:	_____	_____

	Authorized by Owner	Approved by Funding Agency (if applicable)
By:	_____	_____

Title:		
Date:		

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FIELD ORDER FORM

Field Order No. _____

Date of Issuance:		Effective Date:	
Owner:	City of Saratoga Springs	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Bowen Collins & Associates	Engineer's Project No.:	
Project:	Irrigation Well 9	Contract Name:	

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference: _____ (Specification(s)) _____ (Drawing(s) / Detail(s))

Description:

Attachments:

ISSUED:	RECEIVED:
By: _____ Engineer (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____
Date: _____	Date: _____

Copy to: Owner

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GENERAL CONDITIONS

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GENERAL CONDITIONS

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the

Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted

by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

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

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments

during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

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

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;

b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that the proposed item:

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:

    a. will certify that the proposed substitute item will:

        1) perform adequately the functions and achieve the results called for by the general design;

        2) be similar in substance to the item specified; and

        3) be suited to the same use as the item specified.

    b. will state:

        1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

        2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

        3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

    c. will identify:

        1) all variations of the proposed substitute item from the item specified; and

        2) available engineering, sales, maintenance, repair, and replacement services.

    d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

2. *Samples*

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

   c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

   d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

2. Recommendation by Engineer or payment by Owner of any progress or final payment;

3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design

professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to

Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:
   1. A mutually acceptable fixed fee; or
   2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
      a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
      b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
      c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
      d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
      e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
      f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

   a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work;

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

    a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

   d. a list of all duly pending Change Proposals and Claims; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their

reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if

repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00 80 00

SUPPLEMENTARY CONDITIONS

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SECTION 00 80 00

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, “Paragraph SC-4.05.”

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

B. *Evidence of Contractor’s Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

C. *Evidence of Owner’s Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor one electronic portable document format (PDF) copy of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement).

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol (“EDP” or “Protocol”) for exchange of electronic transmittals.

1. *Basic Requirements*

    a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

    b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

    c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

    d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

    e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

    f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

    a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

        1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 40 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

        2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating,

updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

h. The Owner will operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph

will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;

2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;

3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and

4) Include any other Project Website attributes that may be pertinent to Contractor's use of the facility and pricing of such use.

C. *Software Requirements for Electronic Document Exchange; Limitations*

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for

Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.

d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at $**[number]** per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Delete Paragraph 3.01.C in its entirety.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

No suggested Supplementary Conditions in this Article.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018). The warranty bond must be in a bond amount of **10** percent of the final Contract Price. The warranty bond period will extend to a date **1** year after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final application for payment, and in any event no later than 11 months after Substantial Completion.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

SC-6.02

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	**Policy limits of not less than:**
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	Statutory
Each employee	Statutory
Policy limit	Statutory

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible and real property wherever it is located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.

6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).

2. Any exclusion for water intrusion or water damage.

3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.

4. Any exclusion of coverage relating to earth subsidence or movement.

5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).

6. Any limitation or exclusion based on the nature of Contractor's work.

7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$2,000,000
Bodily Injury and Property Damage—Each Occurrence	$2,000,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	**Policy limits of not less than:**
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$1,000,000

K. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage

as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $**3,000,000** after accounting for partial attribution of its limits to underlying policies, as allowed above.

L. M. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

N. 6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $**500,000**

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $**500,000**.

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10 include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Contractor, and Subcontractors of every tier, include as insureds the following:

    a. City officers, officials, employees, and volunteers.

11. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:

12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $**250,000**.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

H. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

1. The builder's risk policy (or if applicable the installation floater) will be subject to a deductible amount of no more than $**25,000** for direct physical loss in any one occurrence.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Delete Paragraph 7.03.C in its entirety, and insert the following:

C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. Owner shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.18.A Replace paragraph A with the following paragraph

A. A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible and real property , including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, assign, or agent, any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

ARTICLE 8—OTHER WORK AT THE SITE

No suggested Supplementary Conditions in this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.13 *Owner's Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner's Site Representative*

A. Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee. Owner's Site Representative will be **a City Inspector.** The authority and responsibilities of Owner's Site Representative **shall be the same as is they were the Resident Project Representative.**

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with the Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02 if the Work is in general proceeding in accordance with the Contract Documents.

b. Observe whether any Work in place appears to be defective.

c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.

b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor.

7. *Completion*

   a. Participate in Engineer's visits regarding Substantial Completion.

   b. Assist in the preparation of a punch list of items to be completed or corrected.

   c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.

   d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.

5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No suggested Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01 Add the following new Paragraph 15.01.D:

F. Owner shall make payment within 30 days of receipt of Engineer's recommendation of payment of a progress payment.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 *Arbitration*

A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of $100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.

C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.

E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.

F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.

G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;

3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and

4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.

H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 *Attorneys' Fees*

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. [Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new Paragraph immediately after Paragraph 17.01" and revise the numbering accordingly].

17.03 *Attorneys' Fees*

A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

No suggested Supplementary Conditions in this Article.

ARTICLE 19—

EXHIBIT A—SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version. Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	
Notes				
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.			
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.			

Key	
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)
PDF	Portable Document Format readable
DWG	Autodesk® AutoCAD .dwg format Version **2019 or more recent**
DOC	Microsoft® Word .docx format Version **Microsoft 365 or compatible**
EXC	Microsoft® Excel .xls or .xml format Version **Microsoft 365 or compatible**

DIVISION 1
GENERAL REQUIREMENTS

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 GENERAL

A. The Work to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all Work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all Work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete, safe and proper construction of the Work in good faith shall be provided by the CONTRACTOR as though originally so indicated, at no increase in cost to the OWNER.

B. The Work shall be conducted in accordance with the Utah Rules for Water Wells (R655-4 UAC) and the requirements of these Technical Specifications.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of this Contract comprises the drilling, logging, construction, developing, and testing of a production well as depicted in the Bid Schedule. The CONTRACTOR is responsible for providing all the labor, materials, and equipment necessary to construct, log, install, develop, and test the wells. Location and site figures as well as drawings of the production wells and associated details are given in the DRAWINGS. The work shall include, but not be limited to, the following at the wells:

1. Mobilization, demobilization, and site cleanup for the production well.
2. Drilling and sampling a minimum 46-inch diameter borehole to a minimum depth of 40 feet, or to an appropriate depth as determined by the CONTRACTOR, as shown on the DRAWINGS.
3. Providing and installing a minimum 40-inch diameter conductor casing and grout seal in the 46-inch diameter borehole.
4. Drilling and sampling a minimum 38-inch diameter borehole to a minimum depth of 150 feet.
5. Providing and installing a minimum 32-inch diameter conductor casing and grout seal in the 38-inch diameter borehole.
6. Drilling and sampling a 13 to 17.5-inch pilot hole and reaming out to a 28-inch diameter borehole to the depth directed by the ENGINEER. The approximate depth for the borehole is 1,200 feet.
7. Keeping a written log of strata encountered during drilling and a written daily record of work progress, crew present, and equipment and materials used.
8. Collecting cuttings representative of strata encountered during drilling of the borehole at least every 5 feet and at major lithology changes or as directed by the ENGINEER.
9. Running geophysical and caliper logs in the pilot borehole.

10. Performing sieve analysis of drill cutting samples from the well as selected by the ENGINEER.
11. Installing a temporary well screen on the end of the drill string with gravel pack and bentonite seals for zone water quality testing and air-lifting/pumping to obtain water quality samples.
12. Running a caliper log in the reamed production borehole.
13. Providing and installing 20-inch diameter low-carbon steel, louvered, 0.060-inch slot (60-slot) well screen for the Well as shown on DRAWINGS that meets or exceeds the calculated collapse strength, open area, and calculated tensile strength in Section 33 11 50, and steel blank casing between screen intervals, with associated appurtenances in the well. Approximate size and quantities of low-carbon steel screen and casing are shown in the DRAWINGS and actual lengths and positions may be modified by the ENGINEER as determined by field conditions. Casing and screen material may be changed from Low Carbon Steel (LCS) to High Strength Low Alloy (HSLA) or Stainless Steel (SST) at the direction of the ENGINEER.
14. Providing and installing 20-inch diameter low-carbon steel well casing above and between the screen with appurtenances. Approximate quantities of low-carbon steel casing are shown in the DRAWINGS and actual lengths and positions may be modified by the ENGINEER as determined by field conditions. Casing and screen material may be changed from Low Carbon Steel (LCS) to High Strength Low Alloy (HSLA) or Stainless Steel (SST) at the direction of the ENGINEER.
15. Providing and installing gravel pack in the well (gradation of gravel pack will be determined from sieve analysis results during borehole drilling but is estimated to be ¼ x ⅛ gradation as shown on DRAWINGS). Approximate quantities of gravel pack are shown in the DRAWINGS and actual quantities may be modified by the ENGINEER as determined by field conditions. Additionally applying a high concentration chlorine treatment (1,500 ppm) during the installation of the gravel pack to thin the drill mud will be required.
16. Providing and installing annular cement grout seal in the well, where applicable. Approximate quantities of annular cement grout are shown in the DRAWINGS and actual quantities may be modified as determined by field conditions.
17. Developing the well by air lifting and mechanical surging with double surge block and simultaneous pumping. Initial well development includes a high concentrated chlorine treatment (1,500 ppm) and a clay dispersant treatment using Johnson Screens NW-220.
18. Providing and installing a pump for development and test pumping.
19. Further developing the well by pumping and surging with a test pump to be supplied by the CONTRACTOR.
20. Separating drill cuttings and development sediments from associated liquids and properly disposing of them.
21. Providing for the transport of development water and pump test water to a discharge point as approved by the ENGINEER.
22. Performing a 10-hour step-rate drawdown test.
23. Performing a 24-hour constant-rate discharge test.
24. Thoroughly cleaning all sediment and debris that has accumulated in the well after test pumping.
25. Performing a Video Camera Survey of the well.
26. Performing plumbness and alignment tests in the well.
27. Disinfecting the well.

28. Constructing the wellhead and capping the well.
29. Restoring the well site to its original condition.
30. Furnishing logs, daily records, and other items as specified to the ENGINEER.

B. In all stages of the project the CONTRACTOR shall record detailed notes and provide copies to the ENGINEER.

C. The ENGINEER reserves the right to change materials and quantities specified in the following documents based on conditions encountered in the field, as specified in Section 02 32 30 SPECIAL CONDITIONS FOR DRILLING. In addition, the ENGINEER reserves the right to discontinue the construction of the well if at any time the ENGINEER believes it is in the OWNER's best interest to discontinue. In such a case, the CONTRACTOR shall be paid at the prices bid for the actual work accomplished.

1.3 DEFINITIONS

A. Standby time shall be paid for any portion of a normal work day when the ENGINEER's representative orders work to cease or when other activities at the site dictate shutdown as approved by the ENGINEER's representative.

B. Downtime shall mean that time, other than standby time, during which drilling could occur but does not or when machinery is broken down, materials or equipment are not available, or the CONTRACTOR elects not to drill. All downtime shall be at the sole expense of the CONTRACTOR.

1.4 GENERAL

A. See Section 02 32 30 SPECIAL CONDITIONS FOR DRILLING, which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.5 SUBMITTALS DURING CONSTRUCTION

A. Submittals during construction shall be made in accordance with Section 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

B. Specific submittal items are specified within individual sections of these Specifications.

1.6 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible for giving the ENGINEER advance notice prior to performance of specific work items as specified within individual sections of these Specifications.

1.7 SPECIALISTS AND CONTRACTORS

A. Portions of the work require operations that are commonly performed by specialists and subcontractors. Well driller, well logging and testing firms, and all others employed in constructing the borehole shall meet the requirements of a Specialist as described in Section 01 13 00 SPECIAL CONDITIONS FOR DRILLING and shall be approved by the ENGINEER.

1.8 STANDARDS, SPECIFICATIONS, AND CODES

A. The well shall be constructed in conformance with the State of Utah Administrative Rules of Water Well Driller's administered through the Utah Department of Water Rights as descried in the Utah Administrative Code R655 (most recent version) and the State of Utah Rules for Public Drinking Water Systems, Design and Construction Standards for Systems administered by the Utah Division of Drinking Water as described in the Utah Administrative Code R309 (most recent version). The requirements of Utah County and Saratoga Springs City where the well is located shall also be observed in construction of the well. The CONTRACTOR shall be responsible for filing the necessary permits and well logs required by the state.

1.9 SITE PROTECTION

A. Throughout the period of construction, the CONTRACTOR shall keep the work site free and clean of all rubbish and debris. Protective barriers and other safety protection necessary to protect the public and workers shall be provided by the CONTRACTOR. The CONTRACTOR shall protect all existing fences, walls, buildings, trees, surface water bodies, wetlands, riparian areas, and landscape during the progress of work. In the event of damage to such property, the CONTRACTOR shall, at his own expense, immediately restore the property to a condition equal to its original condition and to the satisfaction of the ENGINEER. This provision includes damage to surface and subsurface utilities. After completion of the work, the CONTRACTOR shall remove from the premises and work areas all materials, tools, debris, and drill cuttings from the drilling and pump installation operations. At the completion of the well, the site shall be cleared of all materials and left in a condition acceptable to the ENGINEER.

1.10 CONTAMINATION

A. The CONTRACTOR shall at all times perform his operation in such a manner as to prevent the introduction of contaminants into the well. Tools, casings, pumps, and other elements shall be kept clean and disinfected prior to insertion into the well. Water supply and drilling fluids shall be protected from contamination. The ENGINEER will require the materials and equipment to be cleaned and disinfected if, in the ENGINEER's sole opinion, the operation is introducing contaminants into the well.

1.11 DISPOSAL OF MATERIAL

A. The CONTRACTOR shall be responsible for disposing all materials generated during borehole drilling, well construction, well development, and well testing. The materials generated from these activities and any associated activities shall be disposed of as specified in Section 33 20 00 – DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

1.12 LOST HOLES

A. Holes Abandoned For Cause: If the ENGINEER determines that for reasons beyond the control of the CONTRACTOR it is necessary to stop drilling, or the hole is lost before the objective or desired depth is reached and further attempts to save or complete the hole are not practical, the hole will be ordered abandoned for cause. The CONTRACTOR shall fill and plug the hole according to the most restrictive city, county, state and/or federal regulations. The

CONTRACTOR will be reimbursed for the footage drilled and other operations and for moving to an alternative location.

B. Defective Holes: If the ENGINEER determines that the hole is lost due to negligence, incompetence, or malpractice on the part of the CONTRACTOR or his personnel, or to the use of defective or unsuitable equipment, he will immediately notify the CONTRACTOR in writing of his decision and order the hole abandoned. If a hole does not meet the requirements set forth herein, or if the CONTRACTOR fails to drill a hole to the depth specified by the ENGINEER within the scope of the agreement, the hole will be declared abandoned. Any hole that cannot be corrected to the required tolerance for alignment will be declared abandoned. The CONTRACTOR, at his own expense, shall fill and plug the hole(s) according to the most restrictive city, county, state and/or federal regulations. He shall drill a new hole at an alternate site in the immediate area approved by the ENGINEER. The CONTRACTOR will not be paid for any footage drilled or for other operations performed in any hole abandoned because of defects.

1.13 DEPTH OF WELL

A. The actual depth of the production well shall be determined by the ENGINEER based on examination of the drill cuttings, results of the sieve analyses, and geophysical logging of the borehole, and may vary from the well depth shown in the bid documents. For the purposes of bidding, it is expected the total depth of the Well below ground surface will be 1,200 feet.

1.14 EQUIPMENT AND PERSONNEL

A. The ENGINEER must approve mobilization of any equipment or personnel under this Contract.

1.15 WELL SITE

A. Drilling equipment shall be set up within the areas designated by the ENGINEER. Upon completion and acceptance of the work, all equipment, unused materials, temporary facilities, and other miscellaneous items resulting from or used in the operations shall be removed. Each of the sites shall be restored to its original ground configuration by filling any pits or trenches and leveling soil piles or ruts.

B. If additional space is required for temporary storage of materials and equipment within the limits of the site, the CONTRACTOR shall make his own arrangements to obtain the areas. All stored materials and equipment shall be removed from the site as part of demobilization upon completion of this Contract.

PART 2 - PRODUCTS

2.1 GENERAL

A. The use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired only. Products of other manufacturers will be considered in accordance with Section 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 3 - EXECUTION

3.1 GENERAL

A. Equipment: All equipment shall be of the proper type and shall be in good condition to assure that the work can proceed without interruption and that the drilling of a plumb and straight well results. Drilling equipment, including collars and/or couplings, shall be of sufficient size, strength, and design to maintain plumbness and alignment in drilling the well to a depth of 1,200 feet or greater.

END OF SECTION

DIVISION 2
EXISTING CONDITIONS

SECTION 02 32 30
SPECIAL CONDITIONS FOR DRILLING

PART 1 - GENERAL

1.1 GENERAL: This project involves investigating the condition of a pressurized irrigation well and subsequently cleaning, developing, and testing of the Well for Saratoga Springs City herein called OWNER. The irrigation well, referred to as Item A: Irrigation Well 9, is located in Saratoga Springs within Utah County, Utah. The project shall consist of drilling and installing a conductor casing, drilling a pilot borehole; geophysical logging and caliper survey of the pilot borehole; zone testing; reaming the pilot borehole to a production borehole; caliper survey of the production borehole; installation of mild steel casing and stainless steel screen; installation of gravel pack and grout seal; initial well development; pump development and testing of the well; video camera survey; plumbness and alignment testing; and well head completion for the production well. A site location map is included in the FIGURES. The work to be performed under this project shall consist of furnishing all labor, materials, equipment, tools, supplies, and incidental items necessary or required to complete the work in all respects as shown on the DRAWINGS and as herein specified. All work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary to complete the 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 OWNER.

1.2 This project shall be bid based on a lump sum/unit costs as stated in the Bid Schedule. The amounts of work to be done and materials or services to be furnished under contract are noted in the list attached to the Bid Schedule. Quantities are estimates only and shall not be taken as an expressed or implied statement that the actual amount of material or work will correspond to the estimates. Adjustments for overruns and/or underruns shall be made on the values in the Bid Schedule. The OWNER reserves the right to increase or decrease certain items from the work or materials by up to 25 percent if found desirable or expedient by the OWNER, and the CONTRACTOR is cautioned against unbalancing of the bid by prorating overhead into a few items only when there are a large number of items in the proposal. The overhead and indirect charges should be prorated on all items. In the event the Specifications define work to be accomplished for which the proposal does not provide a specific pay item, its costs shall be considered as part of the cost Mobilization/Demobilization/Cleanup.

1.3 The Work hereunder will be constructed under both a unit price and lump sum contract items. The contract time shall be as specified in the Agreement.

PART 2 - SPECIFICATIONS

2.1 The Specifications included in these Contract Documents establish the performance and quality requirements for materials and equipment, and the minimum standards for quality of workmanship and appearance. Any questions on interpretation of any portion of these

Specifications should be directed to and determined by the ENGINEER or their representative.

PART 3 - REASONABLY IMPLIED PARTS OF THE WORK SHALL BE DONE ALTHOUGH ABSENT FROM SPECIFICATIONS

3.1 Specific tasks not completely described in these Specifications that are necessary or normally required as part of the work described, or that are necessary or required to make each installation satisfactorily or legally operable, shall be performed by the CONTRACTOR as incidental work without extra cost to the OWNER, as if fully described in these Specifications. The expense of such work shall be included in the applicable prices for the work described.

PART 4 - SEQUENCE OF OPERATIONS AND COMPLETION OF WORK

4.1 HOURS AND TIME OF WORK

A. Construction activities, except those described below, shall be conducted between the hours of 7:00 a.m. and 10:00 p.m. daily, except Saturdays, Sundays and legally designated holidays during which no work will be allowed unless otherwise designated. Work hours shall conform to Utah County or Saratoga Springs City ordinances and restrictions or local noise permit requirements, whichever is more restrictive. Special permission must be requested and granted, by the OWNER, for conducting work other than during the hours specified. Such permission, if granted, may require the CONTRACTOR to reimburse the OWNER for extra costs for premium pay for construction observation and other OWNER furnished support.

B. The following work activities may be conducted 24 hours a day: drilling, reaming, installation of well casing, screen, gravel pack, and grout, and aquifer tests exceeding 12 hours.

4.2 SCHEDULING

A. Plan the work and carry it out with minimum interference to adjacent land users. Prior to starting the work, confer with the OWNER and its representatives to develop an approved work schedule which will allow minimal interference.

B. CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the Work may affect them.

PART 5 - SITE CONDITIONS

5.1 SITE ACCESS

A. The OWNER has the responsibility to provide legal access to drilling sites. The CONTRACTOR has the responsibility to provide physical access to all drilling sites.

5.2 SITE INVESTIGATION AND REPRESENTATION

A. The CONTRACTOR acknowledges satisfaction as to the nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the prosecution of the work, and all other matters which can in any way affect the work or the cost thereof under this Contract.

B. The CONTRACTOR further acknowledges satisfaction as to character, quality, and quantity of surface and subsurface materials to be encountered from his inspection of the site and from reviewing any available records of other exploratory work. Failure by the CONTRACTOR to become acquainted with the physical conditions of the site and all the available information will not relieve the CONTRACTOR from responsibility for properly estimating the difficulty or cost of successfully performing the work.

C. The CONTRACTOR warrants that as a result of examination and investigation of all the aforesaid data, the CONTRACTOR can perform the work in a good and workmanlike manner and to the satisfaction of the OWNER. The OWNER assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract and (2) the Contract expressly provides that the responsibility thereof is assumed by the OWNER.

5.3 INFORMATION ON SITE CONDITIONS

A. If the OWNER or its representatives provide information concerning subsurface conditions or surface topography, neither the OWNER nor its representatives assume any responsibility whatever in respect to the sufficiency or accuracy of borings, or of the logs of test borings, or of other investigations that have been made, or of the interpretations made thereof, and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout such area, or any part thereof, or that unforeseen developments may not occur.

5.4 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

A. Where the CONTRACTOR's operations could cause damage or inconvenience to telephone, television, power, oil, gas, or water systems, the CONTRACTOR shall make all arrangements necessary for the identification and protection of these utilities and services.

B. The CONTRACTOR shall be solely and directly responsible to the owners and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage that may result from the drilling operations under the Contract Documents. Neither the OWNER nor the ENGINEER, their officers or agents shall be responsible to the CONTRACTOR for damages as a result of the CONTRACTOR's failure to identify and protect utilities encountered in the work.

C. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to drilling operations, CONTRACTOR shall immediately notify the proper authority. The CONTRACTOR shall cooperate with proper authority. The

CONTRACTOR shall cooperate with said authority in restoration of service as promptly as possible.

D. Prior to starting any excavations, the CONTRACTOR shall (at least 48 hours in advance) call Saratoga Springs City Public Works at 801-766-6506 and Blue Stakes Locator Service toll free at 800-662-4111 or locally at 811 and provide all necessary data relative to the proposed excavation. Confirm the location of any potential utilities in the vicinity to avoid them.

5.5 INTERFERING STRUCTURES

A. Protect any and all existing structures from damage, whether underground or above ground. Where existing fences, gates, buildings, utilities, or any other structures must be removed to properly carry out the work, or are damaged during the work, they shall be restored at the CONTRACTOR's expense to their original condition and to the satisfaction of the property owner.

5.6 EASEMENTS AND RIGHT-OF WAYS

A. The work will be located on property owned by the OWNER. The CONTRACTOR shall confine the drilling operations to within the property limits as shown in the DRAWINGS.

B. It shall be the CONTRACTOR’s responsibility to obtain such right-of-way additional to that specified or indicated to be provided as he may require to perform the work required to be performed under the contract.

C. All compensation to be received by the CONTRACTOR for moving, maintaining, and restoring structures and improvements in accordance with the provisions hereof, and for complying with all the requirements prescribed herein, shall be included in the Bid Schedule.

D. Neither the terms thereof nor anything shown on the DRAWINGS, in connection with rights-of-way provided by the OWNER shall be construed to entitle the CONTRACTOR to conduct operations in said right-of-way in violation of any county ordinances or regulations restricting interference with watercourses and drainage channels. The CONTRACTOR shall take adequate precautions against obstructing storm water flow in any affected watercourse or channel, and shall not deposit excavated material anywhere that might interfere with or be subject to erosion from such flow.

E. Nothing herein shall be construed to entitle the CONTRACTOR to exclusive use of any public street or way during performance of the contract work, and he shall so conduct his operations as not to interfere unnecessarily with authorized work of utility companies or other agencies in such streets and ways.

5.7 MAINTENANCE OF EXISTING IMPROVEMENTS

A. Unless otherwise indicated on the DRAWINGS or specified herein, or otherwise called for by the OWNER thereof, all water, sewer, gas, or oil lines, lighting, power, or communication lines, or other surface or sub-surface structures of any nature that may be affected by the work shall be maintained by the CONTRACTOR and shall not be disturbed, disconnected, or damaged by him during the progress of the work.

B. In the event the CONTRACTOR, in the performance of the work, should disturb, disconnect or damage any of the above, he shall bear all expense of whatever nature arising from such disturbances or the replacement or repair thereof. When said damage causes an unscheduled interruption of service, the CONTRACTOR shall immediately alert the utility company involved and shall make the necessary arrangements with the utility company to expedite repairs. Reconstruction shall be of the same types of materials and to the same or better quality as that which existed prior to the start of construction.

C. The CONTRACTOR shall not disturb nor move fences, trees, shrubbery, or other planting along the access routes or adjacent to the well site, except after approval by the OWNER. Any such improvements moved, disturbed or damaged shall be restored by the CONTRACTOR to a condition at least as good as when he entered upon the work.

D. All public and private streets, roads, and driveways and other paved areas damaged or excavated by the CONTRACTOR shall be reconstructed by him with materials, and to a degree of quality at least equal to that which existed prior to the beginning of the project; but in no case shall elements of restoration be inferior to the applicable requirements set forth elsewhere in these specifications.

5.8 FIELD RELOCATION

A. During the progress of construction, it is expected that minor relocations of the work will be necessary. Such relocations shall be made only by direction of the OWNER or its representatives. If existing structures are encountered which prevent the construction, and which are not properly shown on the Drawings, notify the OWNER before continuing with the construction in order that the OWNER may make such field revisions as necessary to avoid conflict with the existing structures. If the CONTRACTOR shall fail to so notify the OWNER when an existing structure is encountered, and shall proceed with the construction despite this interference, he shall do so at his own risk.

PART 6 - TEMPORARY CONSTRUCTION UTILITIES AND FACILITIES

6.1 TEMPORARY WATER

A. The CONTRACTOR is responsible for obtaining water and bearing all costs associated with obtaining a temporary water supply to conduct the work. All water requirements costs will be included in the CONTRACTOR's bid. The OWNER will provide water to the CONTRACTOR at no cost.

B. The CONTRACTOR is responsible for installing temporary pipe, valves, and other appurtenances necessary to convey water to the drill sites from any temporary water service connection obtained by the CONTRACTOR.

6.2 TEMPORARY ELECTRIC POWER

A. Electrical power may or may not be available at the site. The CONTRACTOR is responsible for meeting its own power requirements. All power requirements cost will be included in the CONTRACTOR's bid.

6.3 SANITARY FACILITIES

A. The CONTRACTOR shall provide and maintain sanitary facilities for his employees and his lower-tier Subcontractors' employees that will comply with the regulations of the local and state departments of health and safety. Cost of portable toilets and other appurtenances shall be included in CONTRACTOR's bid.

6.4 TELEPHONE

A. Telephone service shall be established at the well site prior to conducting work and until all production well drilling, logging, construction, developing, and testing is complete. The purpose of this service is to allow the OWNER and ENGINEER to communicate with the CONTRACTOR's representatives or the ENGINEER's onsite personnel. A temporary telephone service or mobile telephone service are acceptable alternatives. The telephone shall be audible/visual to the driller at all times and the number shall be provided to the OWNER and ENGINEER. All telephone costs will be included as a part of the CONTRACTOR's mobilization bid.

PART 7 - SAFETY AND CONVENIENCE

7.1 CONSTRUCTION SAFETY PROGRAM

A. The CONTRACTOR shall develop and maintain for the duration of this Contract, a safety program that will effectively incorporate and implement all required safety provisions. The CONTRACTOR shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety program.

B. The duty of the OWNER and its representatives to conduct construction review of the CONTRACTOR's performance is not intended to include a review or approval of the adequacy of the CONTRACTOR's safety supervisor, the safety program, or any safety measures taken in, on, or near the construction site.

7.2 SAFETY EQUIPMENT

A. The CONTRACTOR, as part of his safety program, shall maintain at his office or other well-known place at the jobsite, safety equipment applicable to the work as prescribed by the governing safety authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of any person who may be injured on the jobsite.

B. The CONTRACTOR shall do all work necessary to protect the general public from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalk or walkway, and trenches or excavations in roadway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the work.

C. The performance of all work and all completed construction, particularly with respect to ladders, platforms, structure openings, scaffolding, shoring, lagging, machinery guards and the like, shall be in accordance with the applicable governing safety authorities.

7.3 ACCIDENT REPORTS

A. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the OWNER. In addition, the CONTRACTOR must promptly report in writing to the OWNER all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses.

B. If a claim is made by anyone against the CONTRACTOR or any lower-tier Subcontractor on account of any accident, the CONTRACTOR shall promptly report the facts in writing to the OWNER, giving full details of the claim.

7.4 TRAFFIC MAINTENANCE AND SAFETY

A. Comply with all rules and regulations of the state, county, and city authorities regarding closing or restricting the use of public streets or highways. No public or private road shall be closed, except by express permission of the OWNER. Conduct the work so as to assure the least possible obstruction to traffic and normal commercial pursuits. Protect all obstructions within traveled roadways by installing approved signs, barricades, and lights where necessary for the safety of the public. The convenience of the general public and residents adjacent to the project, and the protection of persons and property are of prime importance and shall be provided for in an adequate and satisfactory manner.

7.5 PROTECTION OF PROPERTY

A. Protect stored materials, cultivated trees and crops, and other items located adjacent to the proposed work. Notify property owners affected by the construction at least 48 hours in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business. Maintain site surface drainage during construction.

7.6 FIRE PREVENTION AND PROTECTION

A. The CONTRACTOR shall perform all work in a fire safe manner. He shall supply and maintain on the site adequate firefighting equipment capable of extinguishing incipient fires. The CONTRACTOR shall comply with applicable federal, state, and local fire prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

PART 8 - PRESERVATION, RESTORATION, AND CLEANUP

8.1 SITE RESTORATION AND CLEANUP

A. At all times during the work, keep the premises clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, gardens, shrubbery, or fences, regardless of whether these are on private property, or on state, county, or city rights of way. Remove all excavated materials from grassed and planted areas, and leave these surfaces in a condition equivalent to their original condition. Replace top soiled areas raked and graded to conform to their original contours.

C. All existing drainage ditches and culverts shall be reopened and graded and natural drainage restored. Restore culverts broken or damaged to their original condition and location.

8.2 FINISHING OF SITE, BORROW, AND STORAGE AREAS

A. Upon completion of the project, all areas used by the CONTRACTOR shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the abutting property. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain.

8.3 REMOVAL OF ROCK FROM FINISHED SURFACES

A. Remove and dispose of all loose rock and boulders larger than 2-inch diameter occurring on the finished surfaces as a result of the construction operations.

8.4 STREET CLEANUP DURING CONSTRUCTION

A. Thoroughly clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation.

8.5 DUST PREVENTION

A. Give all unpaved streets, roads, detours, or haul roads used in the construction area an approved dust preventive treatment or periodically water to prevent dust. Applicable environmental regulations for dust prevention shall be enforced.

B. During the performance of all work included in the contract or any operations appurtenant thereto, whether on public rights-of-way, easements provided by the OWNER or on private property, the CONTRACTOR shall furnish all the labor, equipment, and means required and shall carry out proper and efficient measures wherever and as often as necessary to prevent his operations from producing dust in amounts damaging to property or causing a nuisance to persons living nearby or occupying buildings in the vicinity. Inadequate dust control by the CONTRACTOR may result in substantial CONTRACTOR liability, as specified in the following paragraph.

C. The CONTRACTOR shall be held liable for any damage resulting from dust originating from his operations whether on public rights-of-way, OWNER’s right-of-way or on other property. All compensation to be received for dust abatement shall be included in the CONTRACTOR’s bid.

PART 9 - MATERIALS AND WORKMANSHIP

9.1 The CONTRACTOR shall, except as specifically stated in the Contract Documents, provide all labor, materials, equipment, tools, and other facilities and services necessary for proper completion of all work under the Contract Documents.

9.2 MAINTENANCE AND GUARANTEE

A. The CONTRACTOR hereby guarantees that the entire work constructed by him under the contract will meet fully all requirements thereof as to quality of workmanship and of materials furnished by him.

B. The CONTRACTOR hereby agrees to make at his own expense any repair or replacement made necessary by defects in materials or workmanship supplied by him that becomes evident within a two-year period after date of final payment, and to restore to full compliance with the requirements of these specifications, including all test requirements, any part of the plant facilities or appurtenant works which during said two-year period is found to be deficient with respect to any provision of the specifications.

C. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written orders for the same from the OWNER. If the CONTRACTOR fails to make repairs and replacements within 5 days upon notification, the OWNER may contract with others for performance of the work and the CONTRACT and his surety shall be liable to the OWNER for the cost thereof.

9.3 Wherever in these Specifications the word "approved" appears, it shall be understood to mean "as approved by the OWNER or authorized representative." Where approvals are required, the CONTRACTOR shall keep a written signed record of those approvals and report such approvals in the daily logs.

9.4 The CONTRACTOR is advised that other contractors or subcontractors may be working at the site during drilling. The CONTRACTOR shall coordinate work with other ongoing activities at the site.

9.5 Since the site may be accessible to the general public, inquiries as to the nature of the work are a possibility. All such inquiries by individuals or news media shall be politely referred to the OWNER.

9.6 SPECIALIST

A. A person, partnership, firm, or corporation of established reputation (or if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular force of workers skilled in either (as applicable) manufacturing or fabricating items required by the Contract Documents, or otherwise performing Work required by the Contract Documents.

B. Where the Specifications require the installation by a Specialist, that term shall also be deemed to mean either the manufacturer of the item, a person, partnership, firm, or corporation licensed by the manufacturer, or a person, partnership, firm, or corporation who will perform the Work under the manufacturer’s direct supervision.

9.7 SUBSTITUTES AND "OR EQUAL" ITEMS

A. Whenever an item of material or equipment is specified or described in the Contract documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, and quality required. Whenever one manufacturer or supplier of an item of material or equipment is mentioned in the Specifications of Divisions 1 and 2, add the words "or equal' after the listed manufacturer or supplier, unless the manufacturer's name is followed by words reading "no or-equal or substitute products will be accepted" or similar wording. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be accepted by the ENGINEER under the following circumstances:

1. "Or-Equal": If in the ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is equivalent to or better than the product named in the form, function, performance, reliability, quality, features, materials of construction, operation and maintenance cost, static and dynamic loads, general dimensional configuration, size, weight, and appearance to that named and sufficiently similar so that no change in related work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.
2. Substitute Items: If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item, it will be considered a proposed substitute item. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute thereof. The procedure for review by ENGINEER will include the following and as ENGINEER may decide is appropriate under the circumstances. Request for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall first make written application to the ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the work will require change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered

by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute.

3. CONTRACTOR's expense: All data to be provided by CONTRACTOR in support of any proposed "or-equal" or substitute item will be at CONTRACTOR's expense.

B. ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 9.7.A.1, 9.7.A.2, and 9.7.A.3. ENGINEER will be the sole judge of acceptability. No "or-equal" will be ordered, installed, or utilized without ENGINEER's prior written acceptance which will be evidenced by a Change Order or an approved Shop Drawing. No substitute will be ordered, installed, or utilized without ENGINEER's prior written acceptance which will be evidenced by a Change Order. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any "or-equal" or substitute. ENGINEER will record time required by ENGINEER, and/or other consultants in evaluating substitutes proposed or submitted by CONTRACTOR in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER accepts a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for charges of ENGINEER and/or consultants for evaluating each proposed substitute item.

C. Proposal by CONTRACTOR to provide "or-equal" or substitute materials or equipment shall be submitted within a maximum of thirty-five (35) days of Contract award. Further, CONTRACTOR agrees that these proposals create a risk that the materials or equipment may not meet the specified functional and performance requirements and create a risk associated with potentially unproven products. Risk arises due to unknowns relating to reliability and durability of product, and responsiveness and support capability of supplier. Limited time is available to review and accept an "or-equal" or substituted item during construction (as compared to time available during design). CONTRACTOR agrees, therefore, that acceptance of an "or-equal" or substitute item does not relieve CONTRACTOR from responsibility for meeting specified functional and performance requirements. CONTRACTOR shall bear all costs necessary to ensure the "or-equal" or substitute item meets specified functional and performance requirements and operates trouble free.

PART 10 - SUBMITTALS DURING CONSTRUCTION

10.1 GENERAL

A. Requirements in this section are in addition to any specific submittal requirements as set forth in Specification sections of these Contract Documents.

B. Review, acceptance, or approval of substitutions, schedules, Shop Drawings, lists of materials, and procedures submitted or requested by the CONTRACTOR shall not add to the Contract amount, and all additional costs which may result therefrom shall be solely the obligation of the CONTRACTOR.

C. The OWNER is not precluded, by virtue of review, acceptance, or approval, from obtaining a credit for construction savings resulting from allowed concessions in the work or materials thereof.

D. It shall not be the responsibility of the OWNER or its representatives to provide engineering or other services to protect the CONTRACTOR from additional costs accruing from such approvals.

E. After checking and verifying all field measurements, CONTRACTOR shall submit to ENGINEER and/or its representatives, in accordance with the schedule for submittals for review, submittals which shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submittal. The data shown shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to enable OWNER to review the information.

F. All samples shall have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which intended.

G. Before submission of each submittal, CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each submittal with other submittals and with the requirements of the work and the Contract Documents.

H. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the submittal may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each shop drawing submitted to OWNER for review and approval of each such variation.

I. OWNER's review will be only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences, or procedures of construction (except where a specific means, method, technique, sequence, or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate review of the assembly in which the item functions.

J. ENGINEER 's review of submittals shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called OWNER's attention to each such variation at the time of submission and OWNER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the shop drawing or sample approval; nor will any approval by OWNER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions herein.

K. Where a shop drawing or sample is required by the Specifications, any related work performed prior to ENGINEER's review and approval of the pertinent submission shall be the sole expense and responsibility of CONTRACTOR.

L. The CONTRACTOR shall furnish a mark-up set of drawings indicating “As-Built” conditions, which shall reflect actual construction details of the well.

M. The CONTRACTOR shall on or about the last day of each calendar month make in writing an estimate of the amount and value of the work done up to that time in the performance of the contract. Such estimates shall include estimated quantities of unit price items of the Bid Schedule and the approved itemized breakdown of any Lump Sum items. Partial estimates shall be subject to adjustments and approval of the OWNER as provided in the General Conditions. Partial estimates and partial payments shall also be subject to deductions and withholding as provided in the General Conditions.

N. Prior to the commencement of work at the site, a preconstruction meeting will be held at a mutually agreed upon time and place. The meeting shall be attended by the CONTRACTOR, its superintendent and its subcontractors as appropriate. Others attending will include the OWNER and the ENGINEER. Unless previously submitted, the CONTRACTOR shall bring to the meeting: construction schedules and a breakdown of contract price.

10.2 SUBMITTAL PROCEDURES

A. Transmit five copies of each submittal to the OWNER or its representative. A specific submittal address and person will be arranged upon award of the Contract.

B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.

C. Identify project, CONTRACTOR, Project Title, Specification section number, description of the submittal, and reference to the Specifications Section and paragraph number being addressed, including products, units and assemblies, 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 Contract Documents.

E. Information documenting the experience of fabricators and manufacturers of materials and equipment to be supplied shall be submitted to the ENGINEER with shop drawing submittals as herein specified.
   1. Information for 3 or more projects including the purchaser, size and type of product provided, date of installation, and the name, address and phone number of a contact person knowledgeable of the project shall be included in these submittals. Experience requirements for manufacturers and fabricators shall be in accordance with the Notice to Bidders.
   2. The company name, address, phone number and name of a contact person of the local service representative of each manufacturer of equipment to be supplied shall be identified in the shop drawing submittals as herein specified.
   3. At a time sufficiently early to allow review as hereinafter specified and to accommodate the rate of construction progress required under the contract, the CONTRACTOR shall submit to the ENGINEER for review, complete shop, assembly and layout drawings of the fabricated materials to be furnished and installed under the contract.

4. Said drawings shall indicate type of steel proposed to be used and five copies shall be submitted prior to manufacture or fabrication of the respective articles.

F. Transmit submittals in accordance with final schedule of submittals.

G. Provide space for ENGINEER review stamps.

H. Revise and resubmit submittals as required, identify all changes made since previous submittal. Revisions shown of said shop assembly, or layout drawings, equipment drawings or catalogue data necessary to meet the requirements of the specifications shall not be taken as the basis of claims for extra charges. The CONTRACTOR shall accept such revisions or submit others for the ENGINEER to review. When delay is caused by the resubmission of details, the CONTRACTOR shall not be entitled to any damages or extensions of time on account of such delay.

I. Submittals will be acted upon by the ENGINEER as promptly as possible, and transmitted to the CONTRACTOR not later than 15 working days after receipt by the ENGINEER.

J. As soon as practicable after acceptance by the ENGINEER of any data or shop, assembly, or layout drawing a final submittal shall be made with all corrections noted by the ENGINEER incorporated. This final submittal shall be clearly noted in CONTRACTOR's submittal as being a final submittal of accepted drawings or data and shall consist of 5 clear legible copies of all information. Final submittals shall be forwarded to the ENGINEER. No Fabrication or other work shall be performed in advance of the receipt of the final accepted drawings and data. The CONTRACTOR shall not deviate in any way from the design, details, or dimensions shown on said final drawings or data without written consent of the ENGINEER.

10.3 SCHEDULES

A. Submit estimated progress schedule and preliminary schedule of submittals in duplicate to OWNER.

B. Show complete sequence of construction by activity, identifying work of separate stages, and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

C. Progress schedule shall provide a workable plan for monitoring the progress of all elements of the work, establish the critical elements of work, and forecast potential problems in maintaining the specified completion dates.

D. When so requested by the OWNER, an updated schedule shall be forwarded to the OWNER no later than the 5th calendar day of the month following. The OWNER's receipt and acceptance of the updated schedule shall be a condition precedent to the issuance of any portion of a progress payment for the preceding month.

E. Progress schedule shall indicate submittal dates, and product manufacture and delivery dates.

F. Preliminary schedule of submittals shall indicate the submittals required by Specification section number with brief description, and starting and completion dates for respective submittal preparation by the CONTRACTOR, and submittal review by the OWNER.

G. Revise and resubmit as required, identify all changes made from previous schedule submittal.

PART 11 - INSPECTIONS AND TESTS OF MATERIALS

11.1 The CONTRACTOR shall furnish the OWNER full information as to the progress of the work in its various parts and shall give the OWNER timely notice of the CONTRACTOR's readiness for inspection. When practicable, inspection will be made during the manufacture of articles. The CONTRACTOR shall furnish, without additional charge, all reasonable facilities and assistance for the safe and convenient inspection and tests required by the OWNER.

11.2 Samples and test specimens required under these specifications shall be furnished and prepared ready for testing in ample time for completion of all necessary tests and analyses before the articles or materials are to be delivered or used. The CONTRACTOR at his own expense shall furnish and prepare all required specimens and perform all required tests and analyses.

11.3 Final inspection and acceptance of the articles or materials may be made after delivery at the site of the work and at the expense of the OWNER. In the event that any material at the site of the work is rejected on account of failure to pass inspection or test, the CONTRACTOR shall replace same promptly. Final inspection will be made as promptly as practicable but may not in all cases be made prior to construction or final assembly.

11.4 The OWNER shall have the right at all times and places to reject articles and/or materials to be furnished hereunder which, in any respect, fail to meet the requirements or these specifications, regardless of whether the defects in such articles or materials are detected at the point of manufacture or after completion of the work at the site. If the observer, through an oversight or otherwise, has accepted material or work which is defective or which is contrary to the specifications, such material, no matter in what stage or condition of manufacture, delivery, or erection may be rejected by the OWNER. Compliance with the specifications is distinctly a duty of the CONTRACTOR and shall not be avoided by act or omission on the part of the OWNER's observer.

11.5 Rejected articles and/or materials shall be removed promptly after notification, to a satisfactory distance from the vicinity of the accepted articles and/or materials at the expense of the CONTRACTOR. Any adjustments, corrections or repairs found necessary after the delivery of articles or materials, including all additional handling and shipping shall be paid for by the CONTRACTOR.

PART 12 - PERMITS, LICENSES, LAWS AND REGULATIONS

12.1 PERMITS AND LICENSES

A. WELL CONSTRUCTION PERMIT

1. Well construction permit applications have been submitted to the Utah Division of Water Rights for the Driller Start Cards and production well construction. The CONTRACTOR shall, within 10 days after completing each production well construction and testing, submit all information required by the Utah Division of Water Rights, including, but not limited to, complete lithologic logs, dates drilled, depth of well, screened intervals, and sealed intervals.

2. The CONTRACTOR shall contact the Utah Division of Water Rights and the Utah Division of Drinking Water to determine their inspection requirements and notify them according to their requirements, so they can inspect construction operations according to their requirements. If any hole drilled by the CONTRACTOR is defective and ordered to be abandoned by the ENGINEER, then the CONTRACTOR shall obtain a permit from Utah Division of Water Rights according to their requirements for abandonment. All costs for compliance will be included in the CONTRACTOR's bid, and no additional compensation will be made for conformance with the permit requirements.

B. NOISE PERMIT

1. The CONTRACTOR shall comply with all federal, state, and local laws, regulations, and ordinances related to noise abatement and bear all costs associated with compliance and permitting.

C. DISCHARGE PERMIT

1. The CONTRACTOR shall comply with all federal, state, and local laws, regulations, and ordinances related to water discharge during the project and bear all costs associated with compliance and permitting.

12.2 LAWS AND REGULATIONS

A. The CONTRACTOR shall comply with all federal, state, and local laws, regulations, and ordinances related to conducting the work and bear all costs associated with compliance.

PART 13 - ENVIRONMENTAL MITIGATION REQUIREMENTS

13.1 AIR QUALITY

A. All earth material excavated, stockpiled, or transported shall be wetted regularly to control dust emissions.

B. Vehicle speed on unpaved access roads shall be limited to 15 miles per hour.

C. Vehicle traffic areas shall be wetted regularly to control dust. Watering should occur at least twice daily with complete coverage, preferably in late morning and after work is done for the day.

D. Trucks transporting earth materials offsite shall maintain a minimum two-foot freeboard.

E. All material transported offsite shall be either sufficiently watered or securely covered to prevent excessive amounts of dust.

F. Equipment engines shall be maintained in good condition and in proper tone as per manufacturer's specifications.

G. All diesel-powered equipment should be turned off when not in use for more than 30 minutes and gasoline-powered equipment should be turned off when not in use for more than 5 minutes.

H. Roadways in the vicinity of construction access points shall be swept as necessary to prevent the accumulation of silt.

13.2 SOIL QUALITY

A. Machinery fluids, such as oil, fuel, hydraulic oil, brake fluid, etc., shall not be allowed to spill or leak onto the ground. In such case that spills occur the contaminated soil shall be removed and disposed of according to relevant environmental regulations and replaced with clean soil.

13.3 WATER QUALITY

A. All drilling fluids, drill cuttings, and water generated during borehole drilling, well construction, well development and well testing shall meet the requirements of Section 33 20 00 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

B. All machinery used in or above the well itself shall be maintained in proper working order as to prevent contamination of well water from lubricating fluids.

PART 14 - PROJECT MEETINGS

14.1 PRECONSTRUCTION CONFERENCE

A. Prior to commencement of work at the site, a preconstruction conference will be held at a mutually agreed time and place which shall be attended by the CONTRACTOR, its superintendent, and its subcontractors as appropriate.

B. The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The compete agenda will be furnished to the CONTRACTOR prior to the meeting date, which may include the following: CONTRACTOR's tentative schedules; transmittal, review, and distribution of CONTRACTOR's submittals; processing applications for payment; maintaining record documents; critical work sequencing; field decisions and change orders; use of project site, office and storage areas, security, housekeeping, and OWNER's needs; major equipment deliveries and priorities; and CONTRACTOR's assignments for safety and first aid.

C. The ENGINEER will preside at the preconstruction conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.

14.2 PROGRESS MEETINGS

A. The CONTRACTOR shall schedule and hold regular on-site progress meetings at least weekly and at other times as required by the ENGINEER or as required by the progress of work. The CONTRACTOR, ENGINEER, and all subcontractors active on the site shall be represented at each meeting. The CONTRACTOR may at its discretion request attendance by representatives of its suppliers, manufacturer's, and other subcontractors.

B. The ENGINEER shall preside at the meetings and provide for keeping and distribution of the minutes. The purpose of the meetings will be to review the progress of work, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop.

PART 15 - MEASUREMENT AND PAYMENT

15.1 GENERAL

A. All work completed under this contract shall be in accordance the DRAWINGS and specifications and will be measured by the ENGINEER. The quantities appearing on the Bid Schedule are approximate only, and are prepared for the comparison of bids. Payment to the CONTRACTOR on bid items with unit prices other than "Lump Sum" will be made for actual quantities of work performed and accepted, or material furnished in accordance with the Contract. The scheduled quantities of work to be done and materials to be furnished may be increased or decreased.

B. The term "Lump Sum" when used as an item of payment will mean complete payment for the work described in the contract. When a complete structure, portion of work, or unit is specified "Lump Sum" as the unit of measurement, the unit will include fittings, accessories, and all work necessary to complete the work as shown on the DRAWINGS and as specified.

C. When the accepted quantities of work vary from the quantities in the Bid Schedule, the CONTRACTOR shall accept as payment in full, so far as contract items are concerned, payment at the original contract unit prices for the work done. The OWNER reserves the right to add to or delete from quantities listed in the Bid Schedule in order to match the total bid with the budget money available.

D. Measurement and calculation of quantities for payment to be as indicated in this section and supersedes the measurement and payment articles in applicable sections of the 1997 Utah Public Works Standard Specifications.

E. Unit prices or lump sum amounts to include full compensation for furnishing all labor, materials, products, tools, equipment, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit, and doing all work shown on the Drawings, defined in the Specifications, and/or stipulated herein.

F. Payment covers the cost of incidental work which includes: progress schedule; CQC program; mobilization and temporary facilities; safety procedure plan; dust control; surface water and drainage handling; coordination with property owners, businesses, contractors, and

government agencies; all provisions required to provide and maintain full and continuous access to all properties affected by construction operations; construction surveying; saw cutting, removal, and disposal of existing trench pavement, curb and gutter, sidewalk, and concrete waterway; unclassified excavation; pot hole excavations; trench excavations; trench shoring or trench boxes as applicable; removal and disposal of waste materials; trench dewatering; pipe zone material; select import fill material; compaction of trench backfill materials; compaction density testing; monument restoration; roadbase; protection and support of existing surface and subsurface features; replacement of concrete waterway and drive approach(es); tree root trimming; replacement and restoration of existing utilities and other items damaged by the CONTRACTOR's operations; removal and replacement of landscape materials and irrigation systems equal to or better than existing if damaged by the CONTRACTOR's operations; installation of sewer manhole invert cover(s) and subsequent removal as directed by governing authorities; and all other necessary work, to install the Work complete in place.

G. BID ITEM A: IRRIGATION WELL 9 BASE BID: Measurement and payment to be as follows:

1. Bid Item A1 – Mobilization/Demobilization/Cleanup
   a. Measurement for Mobilization and Demobilization will be made on a lump sum basis. For purposes of payment, mobilization shall be 75 percent of the bid price for this item. Mobilization to include all equipment and materials necessary to complete the work including, but not limited to, drill equipment, logging, and pump test equipment.
   b. Payment Covers: Cost of mobilization; demobilization, including final site cleanup; obtaining any additional permits not already obtained by the OWNER. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.
   c. For purposes of payment, Mobilization and Demobilization shall be paid for on a percent complete basis. The lump sum bid price for this bid item shall not exceed 15 percent of the total bid price.

2. Bid Item A2 – Sound Control
   a. Measurement: Measured and paid for on a linear foot basis.
   b. Payment Covers: Cost of sound/noise control during the drilling, construction, developing and testing of the production well. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

3. Bid Item A3a – Minimum 40-inch Diameter Conductor Casing and Seal
   a. Measurement: Measured and paid for on a lump sum basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to drill a minimum 46-inch borehole to a minimum depth of approximately 40 feet, or an appropriate depth determined by the CONTRACTOR, and set and seal the corresponding length of minimum 40-

inch diameter, 0.375-inch wall, conductor casing as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

4. Bid Item A3b – Minimum 32-inch Diameter Conductor Casing and Seal
   a. Measurement: Measured and paid for on a lump sum basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to drill a minimum 38-inch borehole to a minimum depth of approximately 150 feet, or an appropriate depth determined by the CONTRACTOR, and set and seal the corresponding length of minimum 32-inch diameter, 0.375-inch wall, conductor casing as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

5. Bid Item A4a – 13 to 17.5-inch Pilot Borehole Drilling
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to drill a 13-17.5-inch pilot borehole to a depth as required by Specifications. The measurement is from 150 feet below ground surface (assumed bottom of the installed conductor casing) to the total depth of the completed well. The measurement does not include any rathole deemed necessary by the CONTRACTOR to log or test the borehole to the specified depth. Also includes cost of disposing drilling fluids, cuttings, and pumped water associated with the borehole drilling. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

6. Bid Item A4b – 28-inch Production Borehole Drilling (Reaming)
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to ream out the pilot borehole after testing and drill a 28-inch borehole to a depth as required by Specifications. The measurement is from 150 feet below ground surface (assumed bottom of the installed conductor casing) to the total depth of the completed well. The measurement does not include any rathole deemed necessary by the CONTRACTOR to log or construct the well to the specified depth. Also includes cost of disposing drilling fluids, cuttings, and pumped water associated with the borehole drilling. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

7. Bid Item A5 – Geophysical Logging
   a. Measurement: Measured and paid for on a lump sum basis.
   b. Payment Covers: Cost of geophysical logging of a pilot well borehole. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

8. Bid Item A6 – Caliper Survey
   a. Measurement: Measured and paid for on a lump sum basis.
   b. Payment Covers: Cost of caliper survey of the pilot and production well boreholes. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

9. Bid Item A7 – Formation Water Zone Testing/Sampling
   a. Measurement: Measured and paid for on a unit cost per zone basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to conduct Zone Testing (Formation Water Samples) as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

10. Bid Item A8 – Additional Zone Development Time
   a. Measurement: Measured and paid for on a unit cost per hour basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to conduct additional Zone Development Time (Formation Water Samples) as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

11. Bid Item A9 – Well Installation - 20-inch Low-Carbon Steel (LCS) Casing
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch mild steel well casing as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

12. Bid Item A10 – Well Installation - 20-inch Well Screen, 100-Slot, LCS Ful-Flo Louvered
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch diameter Low-Carbon Steel Ful-Flo Louvered well screen, 100 slot (range 80 to 120 slot), as required by Specifications and shown on the DRAWINGS. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

13. Bid Item A11 – Installation of Gravel Pack – 1/4x1/8 Gradation
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 1/4x1/8-inch gradation gravel pack (range 6-9 to ½-inch) as required by Specifications and shown on the DRAWINGS. This pay item shall constitute full compensation for all labor, equipment,

tools, supplies, and materials required to complete this portion of the Work for this construction project.

14. Bid Item A12 – Furnish 12% Sodium Hypochlorite (1,500 ppm)
    a. Measurement: Measured and paid for on a per gallon basis.
    b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to provide liquid 12% sodium hypochlorite (chlorine) to the project site as required by Specifications prior to the installation of the gravel pack. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for the project.

15. Bid Item A13 – Initial Well Development with Rotary Drill Rig
    a. Measurement: Measured and paid for on a unit cost per hour basis.
    b. Payment Covers: Cost associated with all labor, materials, supplies, tools, and equipment required for the initial development of the production well as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

16. Bid Item A14 – Furnish 12% Sodium Hypochlorite (1,500 ppm)
    a. Measurement: Measured and paid for on a per gallon basis.
    b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to provide liquid 12% sodium hypochlorite (chlorine) to the project site as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for the project.

17. Bid Item A15 – Furnish NW-220 Treatment
    a. Measurement: Measured and paid for on a per gallon basis.
    b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to provide Johnson Screens NW-220 Clay Dispersant to the project site as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for the project.

18. Bid Item A16 – Mix/Prepare Chlorine and NW-220 Treatment
    a. Measurement: Measured and paid for on a lump sum basis.
    b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to mix and prepare the chlorine and NW-220 treatment solution at surface in appropriate tanks prior to injection. Also includes cost of managing and disposing of any fluids or sediments associated with the installation work. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

19. Bid Item A17 – Inject/Swab Chlorine and NW-220 Treatment with Swab Tool
    a. Measurement: Measured and paid for on a unit cost per hour basis.

b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to inject the chlorine and NW-220 treatment solution evenly into the well. Also includes cost of managing and disposing of any fluids or sediments associated with the installation work. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

20. Bid Item A18 – Install Pump for Well Development and Testing
    a. Measurement: Measured and paid for on a lump sum basis.
    b. Payment Covers: Cost associated with all labor, materials, supplies, tools, and equipment required to provide, install, and remove the pump and associated appurtenance for the development and testing of the production well as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

21. Bid Item A19 – Well Development by Pumping
    a. Measurement: Measured and paid for on a unit cost per hour basis.
    b. Payment Covers: Cost associated with all labor, materials, supplies, tools, and equipment required for the development of the production well by pumping as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

22. Bid Item A20 – Step-Rate Drawdown Test
    a. Measurement: Measured and paid for on a unit cost per hour basis.
    b. Payment Covers: Cost associated with all labor, materials, supplies, tools, and equipment required to test the production well by the Step-Rate Drawdown Test as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

23. Bid Item A21 – Constant-Rate Discharge Test
    a. Measurement: Measured and paid for on a unit cost per hour basis.
    b. Payment Covers: Cost associated with all labor, materials, supplies, tools, and equipment required to test the production well by the Constant-Rate Discharge Test as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

24. Bid Item A22 – Video Camera Survey
    a. Measurement: Measured and paid for on a lump sum basis.
    b. Payment Covers: Cost to video camera survey of the production well. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

25. Bid Item A23 – Plumbness and Alignment Testing

a. Measurement: Measured and paid for on a lump sum basis.
Payment Covers: Cost to perform the plumbness and alignment test for the casing and well screen of the production well. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

26. Bid Item A24 – Disinfecting
    a. Measurement: Measured and paid for on a lump sum basis.
    b. Payment Covers: Cost to disinfect the production well after completion of the well testing and prior to final capping. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

27. Bid Item A25 – Well Head
    a. Measurement: Measured and paid for on a lump sum basis.
    b. Payment Covers: Cost to complete the well head. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

28. Bid Item A26 – Well Capping
    a. Measurement: Measured and paid for on a lump sum basis.
    b. Payment Covers: Cost to cap the production well. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

29. Bid Item A27 – Drilling Fluids and Pumped Water Disposal
    a. Measurement: Measured and paid for on a per 10,000-gallon basis.
    b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to haul and dispose of mud/drilling fluids offsite as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for the project.

30. Bid Item A28 – Drilling Cuttings Disposal
    a. Measurement: Measured and paid for on a per cubic yard basis.
    b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to haul and dispose of drilling cuttings offsite as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for the project.

H. BID ITEM B: ADDITIVE ALTERNATE – HSLA CASING AND SCREEN: Measurement and payment to be as follows:

1. Bid Item B1 – Well Installation - 20-inch High Strength Low Alloy (HSLA) Casing, 0.375-inch Wall

a. Measurement: Measured and paid for on a unit cost per linear foot basis.
b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch High Strength Low Alloy (HSLA) well casing, 0.375-inch wall, as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

2. Bid Item B2 – Well Installation - 20-inch Well Screen, 100-Slot, HSLA, 0.375-inch Wall, Ful-Flo Louvered
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch diameter HSLA, 0.375-inch wall, Ful-Flo Louvered well screen, 100 slot (range 80 to 120 slot), as required by Specifications and shown on the DRAWINGS. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

I. BID ITEM C: ADDITIVE ALTERNATE – 304L STAINLESS STEEL CASING AND SCREEN: Measurement and payment to be as follows:

1. Bid Item C1 – Well Installation - 20-inch 304L Stainless-Steel (SST) Casing, 0.3125-inch Wall
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch 304L Stainless-Steel (SST) well casing, 0.3125-inch wall, as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

2. Bid Item C2 – Well Installation - 20-inch 304L Stainless-Steel (SST) Casing, 0.375-inch Wall
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch 304L Stainless-Steel (SST) well casing, 0.375-inch wall, as required by Specifications. This pay item shall constitute full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

3. Bid Item C3 – Well Installation - 20-inch Well Screen, 100-Slot, 316 SST, 0.375-inch wall, Ful-Flo Louvered
   a. Measurement: Measured and paid for on a unit cost per linear foot basis.
   b. Payment Covers: Costs associated with all labor, materials, supplies, tools, and equipment required to install 20-inch diameter 316 SST, 0.375-inch wall, Ful-Flo Louvered well screen, 100 slot (range 80 to 120 slot), as required by Specifications and shown on the DRAWINGS. This pay item shall constitute

full compensation for all labor, equipment, tools, supplies, and materials required to complete this portion of the Work for this construction project.

END OF SECTION

DIVISION 33
SITE WORK

SECTION 33 11 15
MOBILIZATION/DEMOBILIZATION/CLEANUP

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to mobilize, demobilize, and clean up the drill sites related to the drilling, construction, development, and testing of the Irrigation Well 9.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, equipment, and labor required to accomplish the work as specified.

2.2 SECURITY FENCE

A. A security fence shall be constructed for the protection of materials, tools, and equipment of the CONTRACTOR and lower-tier Subcontractors. At completion of the work, remove fence from the site and restore the area. The security fence shall be constructed at the sole expense of the CONTRACTOR.

B. The CONTRACTOR shall provide access at any time and any necessary keys to the ENGINEER.

2.3 PARKING FACILITIES

A. Parking facilities for personnel working on the project will be limited. Confine employee parking to the designated work area at the well sites.

2.4 NOISE CONTROL FACILITIES

A. Where applicable, the CONTRACTOR will obtain a noise permit from Saratoga Springs City or Utah County. The CONTRACTOR will be fully responsible for compliance to the permit and the CONTRACTOR shall demonstrate compliance with the noise control requirements. A copy of the Saratoga Springs City and Utah County noise regulations are located in Appendix A.

B. Diesel engine acoustical enclosure of steel framed, fiberglass filled panels shall be required for all drill rigs, compressors and pumps. Where these engines are not properly isolated to prevent noise in the supporting structure, this secondary noise shall be mitigated such as by the use of acoustical skirts for drill rig trailers. High performance mufflers shall be used on all diesel engines in regular use on the drill site.

C. Noise barrier walls shall be constructed between the site and the fire station to the northwest to mitigate noise. It is anticipated the noise barrier walls will be limited to the area between the drill site and the fire station. The noise barrier walls shall consist of fiberglass filled acoustical walls, or equal, and have a minimum wall height of 30 feet. The noise barrier walls shall reduce the maximum continuous noise from drilling operations to less than 60 db at 50 feet around the perimeter of the drill site, or to levels designated in the noise permit, whichever is more strict.

PART 3 - EXECUTION

3.1 BOREHOLE DRILLING

A. Set up borehole drilling and related other equipment within the area designated by the ENGINEER. Accomplish all required work in accordance with applicable portions of these Specifications.

3.2 CONSTRUCTION LAYOUT

A. Set up construction facilities in a neat and orderly manner within designated area. Accomplish all required work in accordance with applicable portions of these Specifications. Confine operations to work area shown.

B. Some obstructions may not be shown. Bidders are advised to carefully inspect the existing facilities before preparing their bids. The removal and replacement of minor obstructions such as electrical conduits, water, waste piping, and similar items shall be anticipated and accomplished, even though not shown or specifically mentioned.

C. Major obstructions encountered that are not shown on the Drawings, or could not have been foreseen by visual inspection of the site prior to bidding, should immediately be brought to the attention of the ENGINEER. The ENGINEER will make a determination for proceeding with the work.

3.3 CONTAMINATION PRECAUTIONS

A. Avoid contamination of the project area. Do not dump waste oil, rubbish, or other similar materials on the ground.

3.4 DISPOSAL OF MATERIAL

A. The CONTRACTOR shall be responsible for disposal of all drilling fluids, drill cuttings, development water, and test waters as further described in these Specifications.

3.5 CLEANUP OF CONSTRUCTION AREAS

A. During execution of the work, the CONTRACTOR shall daily clean the site, adjacent properties, and public access roads and dispose of waste materials, debris, and rubbish to assure that grounds, and public and private properties are maintained free from accumulations of waste materials and rubbish. CONTRACTOR will provide containers for collection and disposal of waste materials, rubbish, and debris.

B. Upon completion and acceptance of the borehole, remove from the site the drill rig and related equipment and all debris, unused materials, temporary construction buildings, and other miscellaneous items resulting from or used in the operations. Replace or repair any facility that has been damaged during the construction work. Restore the site as nearly as possible to its original condition.

3.6 NOISE CONTROL

A. The CONTRACTOR shall demonstrate compliance with the noise control requirements. Noise levels shall be monitored at least once daily, and at the request of the ENGINEER, during a time when onsite equipment is in use and noise levels are expected to be the highest. Noise levels shall be measured next to the drill site boundary and at 50 and 100 feet from the drill site using a calibrated and certified sound level meter furnished by the CONTRACTOR and kept on site at all times. Noise levels will also be measured at the property boundary.

B. Night time drilling operations shall be conducted while limiting the following activities: hammering on pipe, racking or making-up of pipe, rapid acceleration and deceleration of diesel engines, and picking up or laying down drill pipe.

C. If, at any time, the noise limits are exceeded, immediate corrective action shall be taken through drilling equipment modifications, addition of noise abatement equipment or changes in operating procedures. Noise levels shall be monitored to demonstrate compliance.

END OF SECTION

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SECTION 33 11 20
CONDUCTOR CASING AND SEAL

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to install two conductor casings and seals including reaming conductor casing boreholes, providing and installing the conductor casings, installing grout seals, and other work as necessary for the production well borehole. Approximate conductor casing borehole depths/diameters and conductor casing diameters and lengths are shown in DRAWINGS. The CONTRACTOR shall install a minimum 40-inch diameter conductor casing to a minimum depth of 40 feet, or to an appropriate depth as determined by the CONTRACTOR, at the well location. The CONTRACTOR will also then install a minimum 32-inch diameter conductor casing to a minimum depth of 150 feet at the well location.

1.2 STATE OF UTAH REQUIREMENTS

A. The CONTRACTOR shall meet the State of Utah Division of Water Rights inspection and certification requirements for placing a seal for a public water supply well, R655-4-12.1.2, U.A.C.. The conductor casing shall have a certified grout seal and appropriate documentation provided by the CONTRACTOR.

1.3 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to starting drilling operations for installing the conductor casing and seal for the well.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

2.2 CONDUCTOR CASING

A. The conductor casing shall be fabricated in lengths not less than 20 feet and shall have a wall thickness not less than 3/8-inch for both the 40-inch and 32-inch casings. Conductor casing shall be ASTM A-53, Grade B, or equivalent as approved by the ENGINEER.

2.3 GROUT

A. Sand-cement grout shall be used to construct the well seal. The sand-cement grout shall be an equal parts mixture of cement and sand/aggregate with no more than 6 gallons of water per one 94-pound sack (one cubic foot) of Portland Cement. The cement shall meet the requirements, including the latest revisions, of ASTM C 150, Standard Specification for

Portland Cement, the State of Utah Source Development R309-515-6(6)(i), U.A.C., and the State of Utah Water Well Handbook – Part II – Minimum Well Construction Standards R655-4-11.4 and 11.5, U.A.C. Portland Cement Type I, II, III & V, or an approved equivalent, and any additives shall meet the requirements, including the latest revisions, of Standard Specifications for Chemical Admixtures for Concrete. Additives must be approved by the ENGINEER.

2.4 WATER

A. Any water used shall be potable. Water will be obtained by the CONTRACTOR.

PART 3 - EXECUTION

3.1 BOREHOLE REAMING

A. The CONTRACTOR shall drill a hole not less than the diameter indicated in the DRAWINGS to a depth below ground surface or deeper as shown in DRAWINGS as determined by the ENGINEER.

3.2 CONDUCTOR CASING INSTALLATION

A. When the conductor casing borehole has been completed, the conductor casing shall be installed. The length of the conductor casing for Item A shall be determined by the ENGINEER during initial borehole drilling, but approximate lengths as shown in DRAWINGS shall be assumed for bidding purposes. All field joints shall be properly butt-welded during installation with a minimum of two passes per circumference. Special care shall be exercised to ensure that the conductor casing is straight and plumb.

B. Four (4) steel guides shall be welded to the conductor casing at 90-degree intervals around the casing and at intervals of not more than 30 feet vertically to centralize and hold the casing in the proper position until the concrete seal is in place. The first set of guides shall be placed 5 feet from the bottom of the conductor casing. A minimum of three sets of guides shall be installed.

3.3 CONDUCTOR CASING SEAL

A. The conductor casing seal shall be placed after the conductor casing bore is completed and the conductor casing is placed in the hole. The annular space between the conductor casing and the conductor casing borehole shall be filled with grout from the bottom of the boring to the required elevation as shown on the DRAWINGS.

B. The grout shall be pumped into the annular space through a tremie pipe or other approved method as approved by the ENGINEER prior to the installation of the seal. A grout pipe shall extend from the ground surface to the bottom of the zone to be grouted. Grout shall be placed, from bottom to top, in a continuous operation. The grout pipe can be slowly raised as the grout is placed, but the discharge end of the grout pipe must be submerged in the emplaced grout at all times until grouting is completed. The grout pipe shall be maintained full to the surface at all times until completion of the grouting of the entire specified interval. Once the grouting operation is complete, no further work shall be performed on the well for a

minimum of 24 hours. No standby time will be paid while cement is setting. In the event of borehole collapse prior to placement of the concrete grout, the CONTRACTOR shall take whatever steps are necessary to reopen the hole and place the seal as specified. Any such remedial action shall be conducted at the CONTRACTOR's expense.

END OF SECTION

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SECTION 33 11 35
PRODUCTION WELL BOREHOLE DRILLING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes drilling of one 13 to 17.5-inch pilot hole and reaming to a minimum 28-inch production well borehole, including drilling, logging, sampling, sieve analysis, and all other materials, equipment, supplies, tools, and labor required to obtain data required for selecting the production well depth, screen interval, slot opening size, gravel pack size, and other information as required.

B. The drilling shall be by the reverse circulation method.

C. Drilling fluids shall be disposed of as specified in 33 11 95 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall give the ENGINEER 48-hour advance notice prior to starting borehole drilling operations for the well.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTACTOR shall submit driller's reports, detailed stratigraphic logs, penetration rate reports, cutting samples and chip tray samples as described below.

B. The CONTRACTOR shall submit sieve analyses results for up to fifteen (15) drill cutting samples of the borehole as specified below.

C. The submittals shall be made in accordance with Part 10 of the SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, equipment, supplies, tools, and labor required to accomplish the work as specified.

2.2 DRILLING FLUIDS (IF NECESSARY)

A. The objective is to avoid intrusion of clays or additives into the aquifer.

B. Only potable water is to be used.

C. Drilling fluid and well additives, if required, shall be approved by the ENGINEER and shall be ANSI/NSF 60 certified. No drilling fluids, chemicals, additives, or conditioners that may be believed to become a food source for bacteria growth in the well or in the aquifer, including phosphates, will be allowed. Only Baroid's "Quick-Gel", CETCO's "Super Gel-X", or equivalent shall be used in the drilling fluid. Organic drilling additives shall not be used. The drilling fluid shall possess such characteristics as are required to adequately maintain the walls of the borehole, to prevent caving of the walls as drilling progresses, and to permit recovery of representative samples of drill cuttings. The use of clay, mud, or other foreign matter that has a tendency to build an excessive mud cake on the walls of the hole and clog or seal up the water-bearing stratum will not be permitted.

D. No drilling fluids, chemicals, additives, or conditioners that may be believed to become a food source for bacteria growth in the well or in the aquifer, including phosphates, will be allowed. If the CONTRACTOR introduces any such materials into the well, the CONTRACTOR shall immediately notify the OWNER and initiate removal of such materials at no additional cost to the OWNER. The CONTRACTOR will then meet with the OWNER and ENGINEER to discuss the conditions related to the violation and at that time be prepared to propose methods and procedures to thoroughly clean the well from all such materials to the satisfaction of the OWNER and ENGINEER at no additional cost to the OWNER. If the CONTRACTOR cannot demonstrate to the satisfaction of the OWNER and ENGINEER that all such materials have been removed, the OWNER shall have no further obligation to pay any invoices for services performed by the CONTRACTOR.

E. Drilling fluid properties shall be maintained to deposit only a thin (maximum of 1/16 of an inch), easily removable filter cake on the face of the borehole. The drilling fluid properties shall be maintained as follows:

1.	Weight:	Not to exceed 9.2 lbs./gallon
2.	Viscosity:	Not to exceed 32 seconds per quart
3.	Sand Content:	Not to exceed 1 percent
4.	Total solids content:	Not to exceed 7 percent.
5.	30-minute water loss:	Not to exceed 15 cc

F. Equipment for measuring fluid properties shall be immediately available at the drill site. Drilling fluid properties, including fluid weight, viscosity, water loss, sand content, and total solids content, shall be checked: 1) every 50 feet of depth drilled; 2) every 4 hours of circulation when not drilling; and 3) as directed by the ENGINEER. The CONTRACTOR shall maintain current records on the site at all times to show: 1) time, depth, and results of all mud tests; and 2) all material added to the system including time, amount, and depth. All drilling fluid test equipment and test procedures shall be equal to those given in the American Petroleum Institute Recommended Practice 13B-1, Recommended Practice Standard Procedure for Field Testing Water-Based Drilling Fluids.

G. The CONTRACTOR shall remove any residual mud cake on the borehole wall during development of the well. Drilling fluids and additives shall be approved by the ENGINEER prior to use.

PART 3 - EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall notify the ENGINEER 5 days (Saturdays, Sundays, and holidays excepted) prior to drilling.

B. The CONTRACTOR shall provide at all times a thoroughly experienced, competent, and Utah-licensed driller present at the site during all operations at the drill site.

C. Logging and Records: The CONTRACTOR shall furnish the ENGINEER a written daily log of the work. Information supplied shall include, as a minimum, accurate depths, thicknesses, and nature of the strata penetrated. Drilling rates, water levels, and other information may also be requested by the ENGINEER. Progress on all phases of the work shall also be reported. These daily records shall indicate all quantities of unit price pay items and be signed daily by the CONTRACTOR. The CONTACTOR shall submit a complete driller's log for the well that carefully and accurately describes the following information:

1. The reference point for all depth measurements
2. The depth at which each change of formation occurs
3. The depth at which first water was encountered
4. The depth at which each stratum was encountered
5. The thickness of each stratum
6. The identification of the material of which each stratum is composed, such as:
    a. General grain size (clay, silt, sand, gravel, cobble, boulder)
    b. Specific grains size (very fine, fine, medium coarse, very coarse)
    c. Relative proportion of grain size
    d. Sorting and color
    e. Cementation
    f. Unified Soil Classification in accordance with ASTM D 2488.
    g. Density (for granular material) or consistency (for fine material)
    h. Particle angularity, particle composition
    i. Plasticity of fines
    j. Structure (stratified, laminated, fissured, lensed, intact, etc.)
7. The depth interval from which each water and formation sample was taken
8. The depth at which hole diameter (bit sizes) change
9. The depth to the static water level (SWL) and changes in SWL with well depth
10. Any and all other pertinent information for a complete and accurate log
11. Any variation in the addition and amount of approved clays or chemical products or water required during drilling and properties of the drilling fluids as described in Part 2, 2.2D DRILLING FLUIDS of this Section and the depth at which such changes occur
12. Depth or location of any lost drilling fluid, drilling materials, or tools
13. Depth of the surface seal, if applicable
14. The nominal hole diameter of the well bore above and below casing seal
15. The amount of cement and bentonite installed for the seal
16. The depth and description of well casing
17. The description (to include length, diameter, slot sizes, material manufacturer) and location of well screens
18. The sealing off of all water-bearing strata, if any, and the exact location thereof

D. The CONTRACTOR shall construct the well in strict conformance with all laws, rules, and regulations, and standards related to the construction of wells in the State, County, and other local jurisdictions as applicable, where the well is located.

3.2 CIRCULATION SYSTEM

A. The CONTRACTOR shall provide a circulation system which will minimize the recirculation of drill cuttings. The system shall include settling tanks of adequate size, a sampling trough, a shaker table, and a desanding-desilting system. The system shall be designed to facilitate the retrieval of representative samples from the discharge with a minimum of recirculation of material. The mud tank system shall be equipped with a shaker table and a desander-desilter system with a minimum of four cones, capable of handling the capacity of the system. The desander-desilter system will have a pump capable of supplying a minimum of 40 psi per cone at 80 gpm per cone minimum.

B. Use only drilling fluids and additives specifically recommended by the manufacturer for use in municipal water well drilling. Avoid contamination of the samples or the aquifer. Do not introduce muds, clays, or drilling aids into the well or use lime, cement, organic matter, or other material to stop circulation losses of the drilling fluid, without reviewing the proposed program with the ENGINEER.

3.3 BOREHOLE DRILLING

A. The production boreholes shall be drilled at the approximate locations shown in the DRAWINGS. Information to be obtained during borehole drilling includes data on grain size distribution and hydraulic properties necessary for selection of the proper well depth, screened interval, slot opening size, and gravel pack size.

B. The production borehole shall be drilled with a minimum of two passes. The first pass shall consist of a 13 to 17.5-inch diameter, pilot hole. Logging specified in 33 11 40 GEOPHYSICAL LOGGING shall be conducted in the pilot hole. After completion of the geophysical logging, the pilot hole shall be reamed out such that the final borehole is at least the diameter shown in the DRAWINGS, so as to be sufficiently large to provide for installation of annular seals and gravel pack material by tremie pipe around the casing and screen as shown in the DRAWINGS. For Bid Item A, the borehole shall be reamed to a 28-inch diameter. For bidding purposes, the depth of the borehole is shown in the DRAWINGS. The ENGINEER reserves the right, however, to increase or decrease the depth of the borehole by up to 25 percent. The ENGINEER will have a representative onsite during the drilling to determine the exact depth of the borehole based on cuttings.

C. The CONTRACTOR shall utilize weighted drill collars and stabilizers on the drill pipe to maintain a straight and plumb borehole.

D. The CONTRACTOR shall control, verify, and correct plumbness, out-of-roundness, and straightness of the drilled hole as the drilling progresses. Such checking shall not relieve the CONTRACTOR from requirements of testing as specified in 33 11 72 PLUMBNESS AND ALIGNMENT.

3.4 SAMPLE COLLECTION

A. Every 5 feet and at each change in the strata, the CONTRACTOR shall collect a large, approximately 3-pound, representative sample of the interval or new strata in accordance with procedures approved by the ENGINEER. The CONTRACTOR shall label and store each sample in a suitable container. Preferably in a gallon Ziploc bag. The label shall include the following information: well name, date, time, and depth interval. The sample containers shall be stored in a manner to prevent breakage or loss. All containers shall be furnished by the CONTRACTOR. Formation samples, immediately after being placed in containers, shall be labeled clearly, either directly on the container or on a tag attached thereto, using ink, indelible pencil, or other medium that is resistant to moisture and sunlight. The CONTRACTOR shall be responsible for the safe storage of formation samples until such times as they are accepted by the OWNER. Time, place, and mode of delivery shall be as directed by the OWNER.

B. The CONTRACTOR shall collect and assemble chip-tray samples of the same samples just described (3.4-A). The chip-tray samples shall be gently washed as to remove drilling fluid from the sample but care shall be taken as to not wash away natural formation fines from the sample. The chip-trays shall be labeled neatly and clearly with the depth interval of the sample. The chip-trays shall become the property of the ENGINEER immediately upon their creation.

3.5 SIEVE ANALYSIS

A. The CONTRACTOR shall determine the grain size distribution of up to fifteen (15) samples selected from the well by the ENGINEER. Data required from the sieve analyses are the cumulative percent retained by each sieve of a particular screen size opening. The samples shall be submitted to a qualified geotechnical laboratory for analysis by ASTM D 422 Test Method. The number of sieves and sieve sizes used for the gradation analysis shall be approved by the ENGINEER prior to conducting the analysis. The required screen sizes shall include, but not be limited to, the following: 3”, 1½”, ¾”, $^{3}/_{8}$”, No. 4, No. 8, No. 16, No. 40, No. 80, No. 100, and No. 200. The data from the sieve analyses will be required before a well screen slot opening and gravel pack size and distribution range will be chosen by the ENGINEER. Therefore, sieve analysis results shall be made available to the ENGINEER within 1 day of the completion of the pilot hole.

END OF SECTION

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SECTION 33 11 40
GEOPHYSICAL LOGGING BOREHOLES

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work, including labor, supplies, materials, tools, and equipment, necessary to provide the following geophysical log of the pilot borehole: spontaneous potential; single point resistivity; temperature; 16" and 64" resistivity; gamma ray, and deviation.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to starting the geophysical logging for each of the boreholes.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the geophysical logs as specified below from the boreholes.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. Upon completion of the pilot borehole, as specified in SECTION 33 11 35 PRODUCTION WELL BOREHOLE DRILLING, and before running of the geophysical logs, the CONTRACTOR shall cease drilling and circulate fluid for not less than one hour. The borehole shall be completely filled with drilling fluid during geophysical logging.

B. The geophysical logs shall be run by a SPECIALIST in the running of such logs, and the results shall be fully explained to the ENGINEER. The set of logs to be obtained shall include spontaneous potential; single point resistivity; neutron; temperature; 16" and 64" resistivity; gamma ray; and deviation. The logs will be provided at 2 vertical scales: 50 feet to 1-inch, and 20 feet to 1-inch. The horizontal scale shall be approved by the ENGINEER. Changes in these requirements may be made if, in the opinion of the ENGINEER, not all of these logs are required. All data shall be recorded digitally.

C. The geophysical logs shall be run in the presence of the ENGINEER and the results, including 3 field copies of each log, provided to the ENGINEER immediately upon completion. The logs shall become the property of the ENGINEER at the time logging is completed. The CONTRACTOR shall provide all geophysical interpretations and analyses to the ENGINEER. Geophysical log interpretation and analyses shall consist of all processes of determining water bearing aquifer information in the hole from geophysical logs, including locations, thicknesses, attractiveness for development, and shall be done by a qualified geophysicist within 48 hours of completion of logging. The geophysical log analyst must demonstrate competence through background, training, and experience. It is the CONTRACTOR's responsibility to ensure that all log analyses and/or interpretations are made by a person so qualified.

D. In addition to the three field copies, the CONTRACTOR shall submit the following for the boreholes:
   1. Five copies of each geophysical log at each scale.
   2. Digital ASCII files (.LAS) of all geophysical data on a CD/DVD, thumb drive and/or email.

END OF SECTION

SECTION 33 11 46
CALIPER SURVEY

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the labor, supplies, materials, tools, and equipment necessary to obtain a caliper log of the pilot borehole and the reamed production well borehole.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to starting the caliper survey for the wells.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the caliper logs from the borehole (pilot and reamed production for the well) as specified below.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. Upon completion of the pilot hole, as specified in 33 11 35 PRODUCTION WELL BOREHOLE DRILLING, the CONTRACTOR shall make a caliper survey of the borehole. The caliper used to perform the survey shall have a minimum of three arms and shall be capable of indicating a hole diameter to 42 inches. The logs shall be provided at 2 vertical scales: 50 feet to 1-inch and 20 feet to 1-inch. The horizontal scale shall be approved by the ENGINEER. All data shall be recorded digitally.

B. If the caliper survey shows the hole to be less than the specified diameter at any point or the hole to be less than the specified depth, the hole shall be reamed or redrilled and resurveyed at the CONTRACTOR's sole expense.

C. The caliper survey shall be run in the presence of the ENGINEER and the results, including 3 field copies of each log, provided to the ENGINEER immediately after completion. The logs shall become the property of the ENGINEER at the time the logging is completed.

D. In addition to the three field copies, the CONTRACTOR shall submit the following for the well:
   1. Five copies of each caliper survey at each scale.
   2. Digital ASCII (.LAS) files of caliper survey data on a CD/DVD, thumb drive or email.

E. The CONTRACTOR will conduct a second caliper survey of the final borehole when reamed out to the final borehole diameter as shown in the DRAWINGS. The second survey shall be run in the presence of the ENGINEER and the results (including 3 field copies of each log, 5 final copies at each scale, and digital ASCII (or LAS) as specified above) will be provided to the ENGINEER immediately after completion. The logs shall become the property of the ENGINEER at the time the logging is completed.

END OF SECTION

SECTION 33 11 47
FORMATION WATER ZONE TESTING

PART 1 – GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to install and perform formation water zone testing in the Well including; installing the Formation Sampling Tool (FST), installing temporary bentonite seals, installing temporary gravel pack, collecting formation water samples at each location, and all other work required to perform this task.

PART 2 – PRODUCT

2.1 GENERAL

A. Provide all temporary materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

B. Provide a field water quality meter capable of measuring pH, temperature, electrical conductivity (EC)/specific conductance (SC), and turbidity of the discharge water.

2.2 TEMPORARY WELL CASING

A. The temporary well casing shall be a minimum inside diameter of six (6) inches.

2.3 TEMPORARY WELL SCREEN (FST)

A. The FST shall be constructed of a twenty (20) foot section of approved pipe. The minimum inside diameter shall be six (6) inches. The FST shall be attached to the end of the drill string. The FST shall be constructed out of uniformly perforated pipe with 1/16-inch perforations. A plate shall be welded to the bottom of the FST as a plug. The ENGINEER may specify different lengths for the FST based upon the test hole lithology and geophysical logs.

2.3 GRAVEL FILL MATERIAL

A. Gravel fill material shall be submitted to the ENGINEER for approval. The gravel fill material shall be composed of sound, durable, well-rounded particles, containing no silt, clay, organic matter, or deleterious materials. Use and placement of the gravel fill material must be pre-approved by the ENGINEER.

PART 3 – EXECUTION

3.1 FORMATION WATER ZONE TESTING

A. The CONTRACTOR will collect formation water samples from selected depths as directed by the ENGINEER. The samples shall be collected with a Formation Sampling Tool (FST) constructed (description follows) by the CONTRACTOR.

1. A 10-foot bentonite pellet plug shall be placed from 10 to 15 feet below the FST target zone. Gravel shall be placed in the hole below, adjacent to, and above the FST to a depth of ten (10) feet above the FST.
2. The gravel-fill material shall be placed in the well bore annulus in accordance with AWWA A100-20, Section 4.7 and Appendix B (Well Construction and Gravel-Pack Installation Methods).
3. Before gravel-fill material placement, the CONTRACTOR shall make adequate preparations for continuous circulation of potable water. The fluid properties shall be approved by the ENGINEER. Potable water shall be circulated while installing the pack. Circulation shall be continuous until the pack is fully in place. The method of gravel placement shall be by hydraulically pumping the gravel through tremie pipe from the bottom of the annulus upward. The rate of gravel placement shall not exceed 1-1/2 feet per minute, as measured by a sounding line, and placement shall proceed without interruption until completion. During placement, the bottom of the tremie pipe shall be no more than 40 feet above the level of the gravel-fill material in the well. Every precaution shall be taken to ensure placement of the gravel-fill material continuously from the bottom of the screen to a point above the well screen without separation or bridging of the materials as they are introduced into the well. Detailed notes shall be kept regarding the quantity of gravel-fill material used vs. the sounding line measurements.
4. With the FST set at the desired depth, a sufficient amount of selected gravel shall be placed in the borehole to a depth of no less than ten (10) feet above the shallowest perforations of the FST. Five (5) feet of fine sand shall be placed above the gravel, followed by at least ten (10) feet of bentonite clay pellets and another five (5) feet of fine sand above the bentonite, for a total of 20 feet.
5. The bentonite clay pellet seal shall be allowed to hydrate for a minimum of two (2) hours.
6. After the bentonite seal has hydrated the CONTRACTOR shall measure the static water level inside the drill string and commence airlifting/pumping water from the zone. The CONTRACTOR shall monitor water loss from the drilling fluid recirculating tank(s) during airlifting. Loss of water from the pits during airlifting is the first physical indication that the seal is leaking. If there is water loss from the pits, then the CONTRACTOR shall take appropriate steps to complete the seal. If the CONTRACTOR is unable to stop the leakage through the seal within 4 hours, the CONTRACTOR shall replace the upper seal at the CONTRACTOR's cost.
7. If the water loss from the pits during airlifting is acceptable to the ENGINEER, then the CONTRACTOR shall continue airlifting. The CONTRACTOR will measure and record, on a 30-minute basis, the pH, temperature, electrical conductivity (EC)/specific conductance (SC), and turbidity of the discharged water. Airlifting shall occur for up to 12 hours, or until the pH and electrical conductivity of the discharged water show no more than a 10 percent fluctuation over two (2) consecutive time periods; and the discharge water is clear. The ENGINEER may shorten or lengthen the airlifting time, based upon the pH, temperature, electrical conductivity (EC), turbidity/clarity of the discharged water. Additional airlifting time shall be coordinated and approved by the ENGINEER prior to exceeding the allotted time.
8. Once the airlifting is complete, the CONTRACTOR shall remove the airline from the drill string, if installed. The CONTRACTOR may then install an appropriate submersible pump. The submersible pump shall have a minimum rated capacity of at least fifty (50) gallons per minute for each sampling zone depth.

9. Prior to starting the pump, the CONTRACTOR shall measure the static water level in the drill string. The CONTRACTOR shall determine the most effective pump setting (feet below surface and feet below static water level) based upon the static water level measurement.
10. The CONTRACTOR shall discharge water at the maximum sustainable rate with the submersible pump. Pumping shall continue for up to 6 hours, or as directed by the ENGINEER.
11. The CONTRACTOR shall measure the pumping water level in the well hourly during pumping operations.
    The CONTRACTOR shall measure and record the pH, EC, temperature, and turbidity every 30 minutes during pumping. The ENGINEER may shorten or lengthen the pumping time depending on the pH, EC, or water clarity.
12. The CONTRACTOR shall measure the pumping water level prior to sample collection. The CONTRACTOR shall assist the ENGINEER in the collection of water samples. The ENGINEER shall be responsible for the transport and analysis of the water samples.
13. When the sampling at the zone is completed, the string of tools shall be raised to the next zone to be tested and the test hole filled with select gravel to within fifteen (15) feet of the next zone. Bentonite pellets, sand, and gravel shall be placed as in the first test.

B. The CONTRACTOR will be responsible for:

1. Keeping an accurate and detailed log during the entire formation-water sampling operation. The log will include the number of sacks and pounds of gravel placed per 10-foot interval, or as required, and the elevation of the gravel pack in the annulus at desired depth to achieve the water sampling for each zone tested. The number of bags/buckets of bentonite and fine sand shall be recorded along with the elevation in the annulus by the CONTRACTOR.
2. Providing an "as-built" drawing of the well construction and logging the seal and gravel placements according to the recommendations of the ENGINEER. If no drawing is prepared, the ENGINEER will be on site to recommend this operation.
3. The CONTRACTOR will not be paid for formation testing hours required because of negligence on his part.

C. Formation water shall be discharged to the mud tank to allow sand produced during zone testing to settle out. A portable pump may be utilized to pump formation water from the tank to the water discharge area designated by the OWNER.

END OF SECTION

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SECTION 33 11 50
PRODUCTION WELL INSTALLATION

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary for the construction of the production well, including the well casing, well screen, and all other work required to construct the wells related to these items.

1.2 WELL CASING

A. Bid Item A includes providing and installing the low-carbon steel (LCS) well casing, including double welding collars, and centralizers. Casing diameters are shown in the DRAWINGS.

B. Bid Item B includes providing and installing the High Strength Low Alloy (HSLA) steel well casing, including double welding collars, and centralizers. Casing diameters are shown in the DRAWINGS.

C. Bid Item C includes providing and installing the 304L Stainless-steel well casing, including double welding collars, and centralizers. Casing diameters are shown in the DRAWINGS.

1.3 WELL SCREEN

A. Bid Item A includes providing and installing the low-carbon steel (LCS), Ful-Flo louvered well screen with centralizers. The CONTRACTOR shall furnish and install the centralizers. The well screens must meet or exceed the calculated collapse strength, open area, and calculated tensile strength specified in Part 2.3 below.

B. Bid Item B includes providing and installing the High Strength Low Alloy (HSAL) steel, Ful-Flo louvered well screen with centralizers. The CONTRACTOR shall furnish and install the centralizers. The well screens must meet or exceed the calculated collapse strength, open area, and calculated tensile strength specified in Part 2.3 below.

C. Bid Item C includes providing and installing the 316 Stainless-steel, Ful-Flo louvered well screen with centralizers. The CONTRACTOR shall furnish and install the centralizers. The well screens must meet or exceed the calculated collapse strength, open area, and calculated tensile strength specified in Part 2.3 below.

D.

1.4 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to installation of well screen and well casing.

1.5 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the following items as specified below:
   1. Drawings and design data on each of the well screens and casing.
   2. Welding certifications of welders.
   3. A mark-up set of drawings indicating "As-Built" conditions, which shall reflect actual construction details of the well, including all dimensions and quantities of materials used.
   4. Casings and screens installed in the wells shall be ANSI/NSF 61 certified.

B. The submittals shall be made in accordance with Part 10 of SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

2.2 WELL CASING

A. Low Carbon Steel (LCS): The well casing shall be low-carbon steel, 20-inch inside diameter, fabricated in lengths not less than 20 feet with welding collars attached, unless otherwise specified in the DRAWINGS. The wall thickness for the 20-inch casing shall be a minimum 0.375-inch. The connection of low-carbon steel shall be welded in accordance with Part 3.1 below.

B. High Strength Low Alloy (HSLA) Steel: The well casing shall be HSLA steel, 20-inch inside diameter, fabricated in lengths not less than 20 feet with welding collars attached, unless otherwise specified in the DRAWINGS. The wall thickness for the 20-inch casing shall be a minimum 0.375-inch. The connection of HLSA steel shall be welded in accordance with Part 3.1 below.

C. 304L Stainless-Steel (SST): The well casing shall be 304L SST steel, 20-inch inside diameter, fabricated in lengths not less than 20 feet with welding collars attached, unless otherwise specified in the DRAWINGS. The wall thickness for the 20-inch casing shall be 0.3125-inch wall (0-200 feet) and 0.375-inch wall (200-1,200 feet). The connection of low-carbon steel shall be welded in accordance with Part 3.1 below.

2.3 WELL SCREEN

A. The well screen shall be 20-inch outside diameter. The total length of screen for the well is estimated as shown in the DRAWINGS, unless otherwise specified by the ENGINEER.

B. Low Carbon Steel (LCS): 20-inch well screen shall be made of low-carbon steel and be of the louvered type as manufactured by Roscoe Moss or equal. The well screen will be furnished and installed by the CONTRACTOR. The screen openings shall be installed with the aperture facing downward. The aperture size shall be 0.10-inch with 192 openings per lineal foot.

The louvered opening width shall be of minimum dimension to provide 3.7% open area for the 0.10-inch slot opening. The wall thickness for the 20-inch screen shall be a minimum 0.375-inch. Well screens shall be accompanied by manufacturer's screen specifications and open area. The minimum screen tensile strength must exceed at least twice the total weight of the screen and any standard wall blank casing suspended below the top screen joint. Well screens shall be accompanied by manufacturer's screen specifications and open area.

C. High Strength Low Alloy (HSLA) Steel: 20-inch well screen shall be made of HSLA steel and be of the louvered type as manufactured by Roscoe Moss or equal. The well screen will be furnished and installed by the CONTRACTOR. The screen openings shall be installed with the aperture facing downward. The aperture size shall be 0.10-inch with 192 openings per lineal foot. The louvered opening width shall be of minimum dimension to provide 3.7% open area for the 0.10-inch slot opening. The wall thickness for the 20-inch screen shall be a minimum 0.375-inch. Well screens shall be accompanied by manufacturer's screen specifications and open area. The minimum screen tensile strength must exceed at least twice the total weight of the screen and any standard wall blank casing suspended below the top screen joint. Well screens shall be accompanied by manufacturer's screen specifications and open area.

D. 316 Stainless-Steel (SST): 20-inch well screen shall be made of 304L SST and be of the louvered type as manufactured by Roscoe Moss or equal. The well screen will be furnished and installed by the CONTRACTOR. The screen openings shall be installed with the aperture facing downward. The aperture size shall be 0.10-inch with 192 openings per lineal foot. The louvered opening width shall be of minimum dimension to provide 3.7% open area for the 0.10-inch slot opening. The wall thickness for the 20-inch screen shall be a minimum 0.375-inch. Well screens shall be accompanied by manufacturer's screen specifications and open area. The minimum screen tensile strength must exceed at least twice the total weight of the screen and any standard wall blank casing suspended below the top screen joint. Well screens shall be accompanied by manufacturer's screen specifications and open area.

E. Dimensions of openings and screen length, as shown in the DRAWINGS, will be 0.10-inch for bid purposes but may be modified by the ENGINEER based upon analysis of formation samples taken during the borehole drilling. Please note that the screen slot size and estimated quantity is subject to change upon evaluation of the pilot hole data. **The CONTRACTOR shall have the appropriate manufacturers on notice for a rush order for the materials required to complete the construction of the production well.**

F. The ENGINEER reserves the right to increase or decrease the length of the well screen by up to 25 percent.

G. Within 24 hours (Saturdays, Sundays, and holidays excepted) after the full depth of the well has been reached, the geophysical logging has been completed, and the sieve analysis results have been received by the ENGINEER, the ENGINEER will decide whether or not a well screen shall be installed. If the ENGINEER decides that the well screen is to be installed, the ENGINEER will specify the lengths and location of the well screen and the locations and lengths of blank casing sections within this same 24-hour period.

PART 3 - EXECUTION

3.1 WELDING

A. All welding shall be conducted in accordance with applicable provisions of the American Welding Society code of good practice.

B. Welders shall be certified in accordance with American Welding Society 010.9-80 for level AR-1 and shall be qualified in the 2G and 5G positions or the 6G position.

C. If applicable, a special weld shall be used to join stainless steel with steel. All welding shall be a full, continuous, running weld and shall conform to the American Welding Society specifications. Welds for connecting stainless steel to steel shall be made using AWS Type E312 or E309 electrodes, or equal.

D. If applicable, a special weld shall be used to join stainless steel to stainless steel. All welding shall be a full, continuous, running weld and shall conform to the American Welding Society specifications. Welds for connecting stainless steel shall be made using AWS Type E308-15 lime coated or E308-16 titanium-coated electrodes, or equal. Reverse polarity d.c. current shall be used with E308-15 rods and a.c. or d.c. reverse polarity with E308-16 rods.

3.2 WELL CONSTRUCTION

A. The CONTRACTOR shall install well casing and well screen. Actual well casing length and well screen length configuration and location may be modified by the ENGINEER, based on the results of the sampling and testing of the production well borehole.

B. The CONTRACTOR shall be responsible for supporting and anchoring the well casing in such a way as to hold them in place during the placement of gravel, during development, and when the well is completed. The bottom of the well casing/well screen assembly shall be at a sufficient distance above the bottom of the hole to ensure that none of the weight of the casing will be supported from the bottom of the hole.

C. All casing welding collars shall be properly lap-welded during installation with a minimum of two continuous passes per circumference. All joints shall be watertight. In addition, beveled edge well casing shall be acceptable and all field joints shall be properly butt-welded during installation with a minimum of two passes per circumference.

D. The casing and well screen shall be joined by a continuous full fillet weld of thickness equal to the thickness of the coupling. All alignment holes shall be completely filled by welding.

E. Dissimilar metals in the casing and/or well screen, including all couplings between the stainless steel/HSLA well screen and steel well casing, shall be joined together using special connectors or welds recommended by the manufacturer for joining such materials.

F. Centralizers shall be fabricated of 5/16-inch steel with the same chemical composition and physical properties as the casing or screen to which they are welded and shall be at least 2 inches wide and at least 2 feet long. Centralizers shall extend out at least 2 inches from the casing wall. Centralizers shall be placed at 60-foot intervals starting 5 feet from the bottom of the string and extending to the ground surface. At least four equally spaced centralizers

shall be placed at each 60-foot interval in such a manner that interference with gravel pack placement is minimized. Centralizers shall be as shown on the DRAWINGS.

G. Casing or screen that fails, collapses, separates, or does not pass the tests for plumbness or alignment shall be repaired or replaced, or a new well drilled, as approved by the ENGINEER, at the CONTRACTOR's sole expense.

H. The casing shall extend a minimum of 36 inches above the anticipated finished ground surface and the natural ground surface shall slope away from the casing. A sanitary, weatherproof seal of a completely welded cap shall be placed on top of the well casing to prevent contamination of the well.

END OF SECTION

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SECTION 30 11 52
INSTALLATION OF GRAVEL PACK AND SEAL BETWEEN SCREENS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the labor, supplies, materials, tools, and equipment necessary to install the gravel pack and seals (if necessary) between well screen sections of the production well.

1.2 GRAVEL PACK

A. This item includes the work necessary to install the gravel pack.

1.3 SEAL BETWEEN WELL SCREENS

A. This item includes the work necessary to install an annular seal between well screens if directed by the ENGINEER. A seal may not be used in construction of the well.

1.4 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to placement of the gravel pack for the wells.

1.5 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the following items for the well as specified below:
   1. A 5-pound sample of each proposed gravel pack material for the well shall be submitted to the ENGINEER with the sieve analysis results for approval prior to delivery of the filter pack to the site. Gravel pack delivered to the site shall be of the same specification. Data sheets shall be from the gravel pack supplier certifying compliance with these specifications.
   2. A mark-up set of drawings indicating “As-Built” conditions, which shall reflect actual construction details of the well, including all dimensions and quantities of gravel pack and seal materials used.

B. The submittals shall be made in accordance with Part 10 of SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

2.2 GRAVEL PACK

A. Gravel for packing the wells shall be provided by PW Gillibrand, LLC, or equal and be of high uniformity. The type, size, gradation, and uniformity of gravel shall be determined by the ENGINEER depending on field conditions determined by the borehole. The gravel pack gradation is estimated to be ¼ x ⅛ gradation for bid purposes as shown on the DRAWINGS, but may be modified by the ENGINEER following review of sieve analyses. All gravel pack material shall be silica sand, hard, water-worn, and washed clean of silt, fine sand, dirt, and foreign matter and shall be ANSI/NSF 61 certified. Crushed gravel will not be accepted. All gravel is subject to the approval of the ENGINEER prior to use in the packing process. Gravel pack gradation may be revised after completion and review of the sieve analysis of the drill cuttings.

2.3 SEAL BETWEEN WELL SCREENS

A. Any annular seals installed at the direction of the ENGINEER between screened intervals shall consist of 1:1 ratio (dry volume) granular bentonite (No. 8 size chips) unless otherwise directed by the ENGINEER.

2.4 WATER

A. Any water used shall be potable. Water will be obtained by the CONTRACTOR.

PART 3 - EXECUTION

3.1 GRAVEL PACK

A. The gravel pack shall be placed in the well bore annulus in accordance with AWWA A100-20, Section 4.7 and Appendix B (Well Construction and Gravel-Pack Installation Methods).

B. The gravel shall be disinfected by the CONTRACTOR according to AWWA A100-20, Sections 4.7 and 4.9 and State of Utah Water Well Handbook – Part II – Minimum Well Construction Standards 655-4-11.6.5, U.A.C. Unlined steel tanks shall not be used for mixing the chlorine disinfection solution. In order to assure that no contamination is introduced into the well, the gravel pack must be washed with a minimum 100 ppm solution of chlorinated water at the surface before it is introduced into the well.

C. Before gravel placement, the CONTRACTOR shall make adequate preparations for continuous circulation of potable water with 1,500 ppm chlorine or thinned drilling mud with 1,500 ppm chlorine. The fluid properties shall be approved by the ENGINEER. The chlorinated Potable water or chlorinated drill mud shall be circulated while installing the pack. Circulation shall be continuous until the pack is fully in place. The method of gravel placement shall be by hydraulically pumping the gravel through tremie pipe from the bottom of the annulus upward. The rate of gravel placement shall not exceed 1½ feet per minute, as measured by a sounding line, and placement shall proceed without interruption until completion. During placement, the bottom of the tremie pipe shall be no more than 40 feet above the level of the gravel pack in the well. Every precaution shall be taken to ensure placement of the gravel pack continuously from the bottom of the well to a point above the

well screen without separation or bridging of the materials as they are introduced into the well. Detailed notes shall be kept regarding the quantity of gravel pack used vs. the sounding line measurements. Additionally, the CONTRACTOR shall record the depth of the gravel following the installation of each super sack and report to the ENGINEER.

D. Should the borehole not take the calculated volume of gravel with allowances for normal losses and settling, the ENGINEER will have cause to reject the well.

3.2 SEAL BETWEEN WELL SCREENS

A. Any annular seals shall be placed as specified by the ENGINEER. Seals shall be installed in the same manner as the gravel pack.

END OF SECTION

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SECTION 33 11 54
INSTALLATION OF ANNULAR GROUT SEAL

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the labor, supplies, materials, tools, and equipment, necessary to install the annular grout seal for the production well.

1.2 STATE OF UTAH REQUIREMENTS

A. The CONTRACTOR shall meet the State of Utah inspection and certification requirements, State of Utah Water Well Handbook – Part II – Minimum Well Construction Standards R655-4-11.4.2, U.A.C., for placing a sanitary seal for water wells.

1.3 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to placement of the annular grout seal for the well.

1.4 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the following items as specified below:
   1. Data sheets on grout composition and weights for each grout batch for the well.
   2. A mark-up set of drawings indicating "As-Built" conditions, which shall reflect actual construction details of the well, including all dimensions and quantities of annular grout seal materials used.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

2.2 GROUT

A. Sand-cement grout shall be used to construct the well seal. The sand-cement grout shall be an equal parts mixture of cement and sand/aggregate with no more than 6 gallons of water per one 94-pound sack (one cubic foot) of Portland Cement. The cement shall meet the requirements, including the latest revisions, of ASTM C 150, Standard Specification for Portland Cement, State of Utah Water Well Handbook – Part II – Minimum Well Construction Standards R655-4-11.4.2.1, U.A.C., Portland Cement Type I, II, III & V or an approved equivalent, and any additives shall meet the requirements, including the latest

revisions, of Standard Specifications for Chemical Admixtures for Concrete. Additives must be approved by the ENGINEER.

2.3 WATER

A. Any water used shall be potable. Water will be obtained by the CONTRACTOR.

PART 3 - EXECUTION

3.1 GENERAL

A. After the gravel pack has been placed and settled to the depth specified by the ENGINEER, an annular grout seal shall be placed from the top of the gravel pack to the ground surface.

B. The grout pipe shall extend from ground surface to the bottom of the zone to be grouted. Grout shall be placed from the bottom to top, in a continuous operation. The grout pipe can be slowly raised as the grout is placed, but the discharge end of the grout pipe must remain submerged in the emplaced grout at all times until the grouting is completed.

C. Portland cement grouts must be allowed to cure a minimum of 24 hours for Type I, II, III & V cement before well drilling, construction, or testing may be resumed. No standby time will be paid while grout is setting.

D. The CONTRACTOR shall take whatever precautions are necessary to prevent the casing from collapsing. In the event that the casing collapses, the CONTRACTOR shall take whatever steps are necessary to reopen the well and place the seal as specified. Any such remedial actions shall be at the CONTRACTOR's sole expense.

E. The CONTRACTOR shall keep a record of the volume of grout used. The volume shall not be less than the calculated volume of the annular space between the well casing and reamed borehole. The CONTRACTOR shall supply the devices to measure the volume of grout placed in the well.

END OF SECTION

SECTION 33 11 60
INITIAL WELL DEVELOPMENT

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the labor, supplies, tools, materials, and equipment necessary for the development of the production well using the rotary drilling rig or other ENGINEER-approved development rig.

B. Water and residual drilling fluids generated during surge block and air lift or submersible pump development shall be disposed of as specified in SECTION 33 11 95 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

C. The total initial well development time is estimated to be equal to that shown in the CONTRACTOR'S bid documents. However, the ENGINEER shall be the sole judge as to when development is complete and may therefore increase or decrease the total development time.

1.2 DEVELOPMENT USING DRILLING RIG OR DEVELOPMENT RIG

A. This item includes the work necessary to surge block and air lift or submersible pump develop the well.

1.3 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 24-hour advance notice prior to beginning well development by surge block and air lift the well.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

2.2 SURGING AND BAILING EQUIPMENT

A. Furnish a surge block consisting of a double rubber swab, bailer, and air lift or submersible pump system, and all necessary appurtenant equipment necessary for developing the well.

2.3 SAND CONTENT MEASURING DEVICE

A. Provide a sand content measuring device such as an Imhoff cone, or equal.

PART 3 - EXECUTION

3.1 GENERAL

A. After the grout seal has been placed in accordance with the preceding Specifications, the CONTRACTOR shall notify the ENGINEER and make the necessary arrangements for conducting well development. The time required for development will be recorded by the hour with one-half hour intervals as the smallest units of time credited to the CONTRACTOR. Fractions of an hour less than one-half hour but exceeding one-quarter hour will be considered to be one-half hour. Fractions of an hour less than one hour but exceeding three-quarters of an hour will be considered to be one full hour. The time to be recorded for well development shall commence when the equipment is installed in the well and is placed in operation, and shall end when development pumping or testing is stopped at the direction of the ENGINEER. No time will be recorded for delays resulting from equipment stuck in the hole; equipment breakdown; arranging major drilling, pumping or testing apparatus; or failure to conduct the operations in a diligent and workmanlike manner by which the desired results could ordinarily be expected.

B. Approximately 1/3 of the initial development budgeted hours shall take place to remove the heavy drilling mud and suspended cuttings using the drill string (open-ended) and the dual swab tool.

C. Following the removal of the heavy drilling mud, and due to the nature of drilling system and the drilling fluids used, the CONTRACTOR will be required to perform a shock chlorination treatment of 1,500 ppm sodium hypochlorite solution and a clay dispersant (NW-220) treatment. The treatment is used to aid in the removal of remaining drilling fluids and mud cake (bentonite and polymers) on the borehole wall and formation. Drilling mud dispersants shall be approved by the ENGINEER and shall be ANSI/NSF 60 approved. The mud dispersant product shall not contain phosphates, nor products that may be believed to become a food source for bacteria growth in the well or in the aquifer. The CONTRACTOR shall inject the sodium hypochlorite and NW-220 mixture into the well at multiple locations in the well screens using the dual swab tool. The method for adding the chemical to the well shall be developed by the CONTRACTOR and approved by the ENGINEER. Time allotted for injection shall be approximately 4 hours.

D. Following the injection of the chlorine and NW-220 solution the CONTRACTOR shall aggressively agitate and mix the solution in the well using a dual swab tool. The screened portions of the well shall be thoroughly swabbed. Surge the solution throughout the well screen for no more than 8 hours by raising and lowering the swab tool. This is to surge the chemicals out of the well casing and into the gravel pack and formation. The mixture shall be left in the well for a minimum of 24 hours and no standby time shall be given during that period. The remaining approximately 2/3 of the initial development budgeted hours will be used to remove the chemical treatment.

3.2 SURGE BLOCK AND AIR LIFT DEVELOPMENT

A. Development shall consist of airlift with the rotary drilling rig so as to both loosen and remove all sand, silt, mud and other solids from the well.

B. A surge block shall consist of a dual rubber swab assembly with two (2) swabs on a 4-inch minimum pipe separated by a 10-foot section of perforated drill pipe. Sufficient perforations shall be drilled between the surge blocks for passage of at least 600 gpm. There shall be a minimum of ten (10) 2-inch minimum diameter holes in the pipe, between the swabs. The rubber swabs shall fit snugly in the well so as to minimize leakage around the swabs. For an example of a dual rubber swab, refer to Groundwater and Wells, Second Edition, Pages 507 and 515 (by Fletcher G. Driscoll, 1986, published by Johnson Division, St. Paul, Minnesota 55112).

C. Airlifting or pumping and surging from each treatment interval shall continue for each screened/perforated interval in the well, or until all sand, silt, mud, and other solids have been removed from the treatment interval or as directed by the ENGINEER. Multiple development passes shall be used as directed by the ENGINEER. Airlifting or pumping and surging shall begin at the top of the screened interval and work downward to the bottom of the lower-screened interval. The quality, quantity and type of solids removed from the well shall be recorded by the CONTRACTOR.

D. Solids settling is required before the water is discharged from the surface storage tank, as well as adherence to other State of Utah Division of Water Quality requirements.

E. Disposal of water produced during development and the collected solids is the responsibility of the CONTRACTOR, and shall be done in accordance with all applicable laws and regulations. The CONTRACTOR shall obtain all permits that are required for disposal of the waste materials.

F. Periodically, the CONTRACTOR shall measure and bail from the well all sand, silt, and clay that has accumulated at the bottom. Development shall be continued until all cuttings, fines, sand, mud and drilling fluids have been removed from the well. Upon completion of this operation, the well shall be bailed clean of all accumulations of mud, sand, rock, or sediment to its full depth prior to commencing the pumping of the well. The CONTRACTOR also has the option to airlift from the base of the well with an open ended suction line to remove accumulated sediments.

G. The CONTRACTOR shall run potable water <u>continuously</u> down the gravel feed tube during the operation and add gravel as needed to maintain a level in the tube as directed by the ENGINEER.

H. Sand measurements shall be made with an Imhoff cone at the start and finish of airlift pumping at each 20-foot interval.

I. The total amount of material removed from the well during bailing or airlifting shall be recorded in the Driller's log.

END OF SECTION

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SECTION 33 11 62
INSTALL PUMP FOR WELL DEVELOPMENT AND TESTING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to provide, install, and remove the pump and associated appurtenances for development, test pumping, and water level measurement, and includes installation of two (2) 1-inch water level measurement access pipes. The sounder pipes must be of sufficient size for the CONTRACTOR supplied electronic well sounder and pressure transducers.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

B. Plumbness and alignment testing will be performed prior to installing the test pump in accordance with SECTION 33 11 72 PLUMBNESS AND ALIGNMENT.

2.2 SAMPLE PORT

A. Provide a sample port at the well head for the collection of water quality samples.

2.3 SAND CONTENT MEASURING DEVICE

A. Provide a sand content measuring device such as a Rossum centrifugal sand separator, or equal.

2.4 FLOW MEASUREMENT

A. Provide an orifice plate and manometer capable of reading the maximum pumping rate.

B. Provide an in-line totalizing and instantaneous flow meter capable of the maximum pumping rate.

PART 3 - EXECUTION

3.1 GENERAL

A. Following the completion of initial development with the drill rig, the CONTRACTOR shall install a deep well high-capacity test pump to perform the development of the wells by pumping. The CONTRACTOR shall mobilize and commence development with the test pump within 1 week (7 calendar days) of completion of initial development with the drill rig. If the

CONTRACTOR does not commence development with the test pump within the 1-week period, the CONTRACTOR will perform 4 hours of development with the test pump for each day delay at no additional cost to the OWNER. The test pump shall not be removed from the well until all well testing, including recovery monitoring, is complete. All fuel shall be provided by the CONTRACTOR.

B. Provide 2 sounding tubes adequate for insertion of water level sensing devices into the well before, during, and after the test pumping. The access pipe must allow free passage of pressure transducers that are 1-inch in diameter and approximately 8-inches long. The sounding tube shall be securely fastened to the pump column assembly, terminate approximately 5 feet above the pump, and be perforated along the bottom 10 feet.

C. The test pump shall be of a type and capacity to pump under the performance conditions outlined in the following table, unless otherwise directed by the ENGINEER.

Well Name	Pump Capacity (gpm)	Minimum Pump Setting* (ft bgs)	Maximum Pump Setting (ft bgs)
Irrigation Well 9	1,000-5,000	300	400

*The CONTRACTOR shall set the test pump between the minimum and maximum pump setting. The CONTRACTOR shall be responsible for lowering the pump setting as necessary to achieve the maximum test pump capacity.

D. The prime motor shall be of a variable-speed type and be equipped with sound-deadening devices as appropriate. Discharge piping shall be provided by the CONTRACTOR and be of sufficient size and length to conduct water to the wastewater disposal area as specified in 33 11 95 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL. The CONTRACTOR shall provide instantaneous and totalizing flow meters or other approved devices that will measure the flow rate to an accuracy of at least 5 percent. The CONTRACTOR shall also provide an orifice plate and manometer with appropriate apparatuses to measure discharge flow from the well.

END OF SECTION

SECTION 33 11 64
WELL DEVELOPMENT BY PUMPING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to develop the production well by pumping.

B. Water generated during pump development shall be disposed of as specified in SECTION 33 11 95 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to beginning well development pumping for the well.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit pump development data for the well using a form provided by the ENGINEER.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall monitor and document the specific capacity (pumping rate and drawdown) of the well as it is developed with the pump. The monitoring frequency and instrumentation shall be approved by the ENGINEER.

B. After installation of the test pump equipment, the CONTRACTOR shall commence well development by pumping and surging to clear the well of all additional accumulation of mud, sand, and sediment. The initial pumping rate shall be restricted and, as the water clears, shall be gradually increased until the maximum rate is reached. The step increase discharge schedule and maximum pumping rate shall be determined by the ENGINEER prior to the initiation of pumping. The quantity shall be measured by an approved orifice

plate and manometer or other method approved by the ENGINEER. At regular intervals, the pump shall be stopped and the water in the pump column allowed to surge back through the pump intake, and the pump restarted. These surging operations, with increasing pumping rates, shall be repeated as development of the well continues and shall be done in a manner satisfactory to the ENGINEER.

C. The well shall be considered thoroughly developed when it produces water at its maximum discharge rate, based on the depth and nature of the strata screened, and does not produce fine sands in excess of the sand production limitations or is considered sufficiently developed by the ENGINEER. The sand production limitations shall be that the water produced by the well contains less than 5 parts per million of sand after 20 minutes of surging and pumping at the desired capacity of the well. In addition, the specific capacity will be stable at any selected pumping rate. During the development pumping, the rate of sand production shall be measured by a centrifugal sand separating meter, such as a Rossum Sand Tester, as described in the Journal of American Water Works Association, Volume 45, No. 2, February 1984. The Rossum Sand Tester shall be provided by the CONTRACTOR and placed in a location approved by the ENGINEER. Development procedures, quantities, sand production, and times shall be recorded in the Driller's Log.

D. Upon completion of the development operations, the CONTRACTOR shall demonstrate to the satisfaction of the ENGINEER that the bottom of the well is clear of all sand, mud, and other foreign material.

END OF SECTION

SECTION 33 11 66
STEP-RATE DRAWDOWN TEST

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to test the production well by the Step-Rate Drawdown Test.

B. Water generated during pump testing shall be disposed of as specified in SECTION 33 11 95 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to beginning the step rate drawdown test for the well.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit pump test data for the well.

B. The submittals shall be made in accordance with Part 10 of SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. A step-rate drawdown (discharge) test shall be performed to determine well performance characteristics.

B. The step-rate drawdown test will be performed after the well has been sufficiently developed by the test pump as approved by the ENGINEER.

C. The CONTRACTOR shall monitor and document the specific capacity (pumping rate and drawdown) of the well as it is pumped. The monitoring frequency and instrumentation shall be approved by the ENGINEER.

D. During the step-rate drawdown test the discharge rates from the pump shall be controlled by both a valve and engine throttle. The discharge rate shall be controlled and maintained at approximately the desired discharge rate for each step with an accuracy of at least plus or minus 5 percent. Pump discharge rates shall be measured with instantaneous and totalizing flow meters, as approved by the ENGINEER.

E. The well shall be "step" tested at rates of approximately 1/2, 3/4, 1, 1.25, and 1.5 times the design capacity of the well. The test shall be conducted under the supervision of the ENGINEER.

F. Whenever continuous pumping at a uniform rate has been specified, failure of pump operation shall require that the test be aborted and further testing suspended until the water level in the pumped well has recovered to its original level. For the purposes of this section, recovery shall be considered "complete" after the well has been allowed to rest for a period at least equal to the elapsed pumping time of the aborted test, with the exception that if any three successive water level measurements spaced at least 20 minutes apart show no further rise in the water level in the pumped well, the test may be resumed at the direction of the ENGINEER.

G. Any test that does not meet the duration requirement specified above, or that is initiated too soon after an aborted test as defined above, shall be declared invalid, and the CONTRACTOR will not be paid for the invalid test.

3.2 WATER LEVEL MEASUREMENT

A. Equipment needed to adequately monitor water level before, during, and after the step-rate drawdown test includes:
   1. Electronic water level sounder (Solinst or equal) of sufficient length to monitor water level.
   2. Pressure transducer (In-Situ Inc. PXD-261, Level TROLL, or equal) to be placed in the water level sounding tube of sufficient length to remain below the water table during the entire duration of the pumping test.
   3. Data logger (Virtual HERMIT, Level TROLL, or equal) for the purpose of obtaining frequent and automated water level readings during the pump test.

B. Hand (manual) measurements of depth to water shall be performed before and after the test using an electronic water level sounder to test the accuracy of the transducer. Manual measurements will also be performed during the pumping test at a frequency approved by the ENGINEER. The data logger and transducer shall be set-up and started prior to the pump test so that the initial static water level is determined and recorded. Several measurements shall be taken over the 24-hour period before the test. The data logger will be set up to record water level measurements at a logarithmic time frequency as the pumping is started. At a minimum, water level measurements will be collected in accordance with the following table:

Time Since Pumping Started/Stopped (minutes)	Time Interval for Drawdown Measurements (minutes)
0-10	0.5-1
10-15	1
15-60	5
60-120	30
120-End of step	60 (1 hour)

C. Flow rates shall be measured accurately and recorded at the same time interval as drawdown data.

D. After pumping is terminated, recovery shall be monitored for at least 6 hours or until 85 percent recovery is completed.

END OF SECTION

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SECTION 33 11 68
CONSTANT-RATE DISCHARGE TEST

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to test the production well by the Constant-Rate Discharge Test.

B. Water generated during pump testing shall be disposed of as specified in SECTION 33 11 95 DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to beginning the constant-rate discharge test for the well.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit pump test data for the well.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. A long-term constant-rate discharge test shall be performed to determine local aquifer characteristics.

B. The constant-rate test shall be conducted not less than 12 hours after completion of the step test by pumping the well at the design rate for a period of 24 hours, or until the ENGINEER terminates the test. When the pumping is terminated, the CONTRACTOR shall not conduct any activities for the duration that the well was pumped that might affect water levels in the well during the recovery period.

C. The CONTRACTOR shall monitor and document the specific capacity (pumping rate and drawdown) of the well as it is pumped. The monitoring frequency and instrumentation shall be approved by the ENGINEER.

D. During the constant-rate drawdown test the discharge rate from the pump shall be controlled by both a valve and engine throttle. The discharge rate shall be controlled and maintained at approximately the desired discharge with an accuracy of at least plus or minus 5 percent. Pump discharge rates shall be measured with an instantaneous and totalizing flow meter and orifice plate/manometer apparatus, as approved by the ENGINEER.

E. Whenever continuous pumping at a uniform rate has been specified, failure of pump operation shall require that the test be aborted and further testing suspended until the water level in the pumped well has recovered to its original level. For the purposes of this section, recovery shall be considered "complete" after the well has been allowed to rest for a period at least equal to the elapsed pumping time of the aborted test, with the exception that if any three successive water level measurements spaced at least 20 minutes apart show no further rise in the water level in the pumped well, the test may be resumed at the direction of the ENGINEER.

F. Any test that does not meet the duration requirement specified above, or that is initiated too soon after an aborted test as defined above, shall be declared invalid, and the CONTRACTOR will not be paid for the invalid test.

G. The CONTRACTOR shall provide all information to the ENGINEER regarding the type of pumping equipment used, including engines, drive components, bowls, lines, and shafts. The CONTRACTOR shall keep records of the operation of equipment during the tests including engine rpm and horsepower, fuel use, and other essential information that will be useful in designing a pump system.

H. After completion of water level monitoring, and after the pump has been removed from the well, the CONTRACTOR shall remove all sand and debris that has accumulated in the bottom of the well.

I. During the constant rate pump test, the CONTRACTOR will provide assistance and access to the ENGINEER for collecting water quality samples from the pump discharge water. Approximately one water quality sample may be taken for the full suite of Safe Drinking Water Act parameters near the end of the test.

3.2 WATER LEVEL MEASUREMENT

A. Equipment needed to adequately monitor water level before, during, and after the constant-rate pumping test include:
   1. Electronic water level sounder (Solinst or equal) of sufficient length to monitor water level.
   2. Pressure transducer (In-Situ Inc. PXD-261, Level TROLL, or equal) to be placed in the water level sounding tube of sufficient length to remain below the water table during the entire duration of the pumping test.

3. Data logger (Virtual HERMIT, Level TROLL, or equal) for the purpose of obtaining frequent and automated water level readings during the pump test.

B. Hand (manual) measurements of depth to water shall be performed before and after the test using an electronic water level sounder to test the accuracy of the transducer. Manual measurements will also be performed during the pumping test at a frequency approved by the ENGINEER. The data logger and transducer shall be set-up and started prior to the pump test so that the initial static water level is determined and recorded. Several measurements shall be taken over the 24-hour period before the test. The data logger will be set up to recorded water level measurements at a logarithmic time frequency as the pumping is started. At a minimum, water level measurements will be collected in accordance with the following table:

Time Since Pumping Started/Stopped (minutes)	**Time Interval for Drawdown Measurements (minutes)**
0-10	0.5-1
10-15	1
15-60	5
60-300	30
300-End of test (minimum 24 hours)	60 (1 hour)

C. Flow rates shall be measured accurately and recorded at the same time interval as drawdown data.

D. After pumping is terminated (24-hour minimum test duration) recovery shall be monitored for at least 6 hours or until 85 percent recovery is completed.

END OF SECTION

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SECTION 33 11 70
VIDEO CAMERA SURVEY

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to make the video camera survey.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to beginning the video camera survey for the well.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the video camera surveys for the well (Bid Item A) as specified below.

B. The submittals shall be made in accordance with Part 10 of SECTION 01 13 00 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. After completion of the well discharge test, a color video camera survey shall be run the full depth of the well by the CONTRACTOR. Any sediment that may have accumulated in the bottom of the well should be cleaned out prior to the video survey. The equipment used shall produce a DVD with an automatic depth indication. The camera shall be disinfected prior to being placed in the well. The proposed camera survey shall receive the ENGINEER's approval before being performed. The survey shall be performed in the presence of the ENGINEER.

1. Unless otherwise directed by the ENGINEER, accumulated sediment in the bottom of the well shall be cleaned out prior to the video survey. Since a bailer may be insufficient to remove fines (silt and clay), an airlift line or submersible pump shall be run to the bottom of the well to pump out accumulated fines. Significant sediment in the well shown by the video survey shall be cause for additional cleaning of the well and rerunning the video survey.

B. In the event a clear video is not available, clearing the well with a flocculent will be required to obtain a good quality video survey. Prior to conducting the video survey, the CONTRACTOR shall clear the well with a NSF certified flocculent. The CONTRACTOR shall mix 1 quart of Baroid EZ Mud, or approved equivalent, with 55 gallons of potable water and pour it into the well. The CONTRACTOR shall then pour 5 gpm of potable water from a chlorinated municipal source into the well for a 12-hour period (3,500 gallons water). The well clearing procedure shall be used prior to each video performed on the project.

C. After clearing the well with the flocculent solution and potable water, a color video camera survey shall be performed the full depth of the well by the CONTRACTOR.

D. The equipment used shall produce a DVD with an automatic depth indication at 1-foot intervals (maximum). The beginning and end of the video shall contain the date and well name. The DVD disks and box or flash drive (USB) shall be labeled clearly with the date and well name. The video camera shall have vertical down-hole and horizontal side-hole viewing capability. Horizontal side-hole viewing shall be controllable to allow viewing at any angle within a 360-degree rotation.
   1. A dynamic vertical down-hole view video shall be run from the top of the well to the bottom of the well at a speed not exceeding 30 feet per minute.
   2. The video camera during the dynamic vertical down-hole view run shall be interrupted at the direction of the ENGINEER for periodic static horizontal side-hole viewing.

E. The CONTRACTOR shall provide the ENGINEER with the original DVD or flash drive (USB) within 48 hours of the completion of the survey.

F. The ENGINEER reserves the right to inspect the video of the well for defects in the well casing. Any defects noted will be either cause for rejection by the ENGINEER or correction by the CONTRACTOR. If defects in the casing are found and the cause is due to installation by the CONTRACTOR, the CONTRACTOR shall bear the cost for the necessary repairs and the cost of resurveying the hole.

END OF SECTION

SECTION 33 11 72
PLUMBNESS AND ALIGNMENT

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to perform the plumbness and alignment test for the casing and screen.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to beginning the plumbness and alignment survey for the well.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the plumbness and alignment survey data for the well as specified below.

B. The submittals shall be made in accordance with Part 10 of SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall use every precaution to ensure the well is straight and plumb, and without bend or offset. Plumbness and alignment of the well shall be tested after the CONTRACTOR completes the well and before the test pump is installed in the well. This may be completed after the pump development and testing after coordination with the ENGINEER. The CONTRACTOR shall provide all materials necessary for the plumbness and alignment tests and shall perform the tests. The CONTRACTOR shall provide a written report on the results of the tests. Failure to meet the plumbness or alignment limitations as herein set forth are the responsibility of the CONTRACTOR and shall be subject to correction at his sole expense.

B. The well shall be tested for alignment and plumbness by running an approved gyroscopic log meeting the requirements of AWWA A100-20, Appendix D. Test shall be performed in the presence of the ENGINEER. The results shall be plotted by the CONTRACTOR as

specified in AWWA A100-20 Appendix D and submitted to the ENGINEER. The maximum allowable horizontal deviation (drift) shall not exceed two-thirds of the smallest inside diameter of that part of the well being tested per 100 feet of depth.

C. Alignment of the casings and well screens shall be tested by lowering into the well a section of pipe 40 feet long or a dummy of the same length. The outer diameter of the test pipe or dummy shall not be more than ½ inch smaller than the inside diameter of that part of the casing or hole being tested. If a dummy is used, it shall consist of a rigid spindle with a minimum of three rings, each ring being 12 inches in length. The rings shall be truly cylindrical and shall be spaced one at each end of the dummy and one ring in the center. The central member of the dummy shall be rigid so that it will maintain the alignment of the axes of the rings. The maximum allowable misalignment or "dogleg" is one that will allow a 40-foot long section of pipe or dummy to pass freely through it.

D. The plumbline may be suspended from the drilling rig or from a tripod with winch. An adjustable guide block shall be provided so that the test pipe or dummy will hang in the exact center of the top of the well casing. As the pipe or dummy is lowered into the hole, the deflection of the plum line from the exact center of the casing will be measured every 10 feet.

E. The maximum allowable horizontal distance between the actual well centerline and a straight line representing the proposed pump center line shall not exceed one-half the difference between the inside diameter of the casing and the outside of a 14-inch outside diameter pump bowl.

END OF SECTION

SECTION 33 11 80
DISINFECTING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to disinfect the well after completion of well testing and prior to final capping. The pump used for well development and testing shall be removed prior to disinfection.

1.2 NOTIFICATION TO THE ENGINEER

A. The CONTRACTOR shall be responsible to give the ENGINEER 48-hour advance notice prior to beginning the disinfecting for the well.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified. Any water used shall be potable.

B. Furnish the following chemicals:
   1. 45 gallons – Liquid Sodium Hypochlorite (12%)
   2. 10,000 gallons – Potable Water

PART 3 - EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall notify the ENGINEER and make the necessary arrangements for conducting the disinfection treatment.

B. The CONTRACTOR shall conduct the video survey of the well prior to conducting the disinfection treatment.

C. After the completion of the well and before final capping of the well head, the well shall be disinfected by a chlorine solution in accordance with AWWA A100-20, Section 4.9, ANSI/AWWA C654, and the State of Utah Water Well Handbook – Part II – Minimum Well Construction Standards R655-4-11.6.5 (most recent versions).

D. Unless superseded by Laws and Regulations, the quantity of sodium hypochlorite added to the well shall be sufficient to produce a minimum of 100 ppm available chlorine when mixed with the total volume of water in the well. If the well is a gravel packed well, the total volume of water includes the water in the gravel pack.

E. The sodium hypochlorite shall be delivered to the site in original closed containers bearing the original label indicating the percentage of available chlorine and date of manufacture. The sodium hypochlorite shall not be more than 2 weeks old.

F. The CONTRACTOR shall prepare the disinfectant by mixing a concentrated solution of sodium hypochlorite and water in suitable mixing tanks. Unlined steel tanks shall not be used for mixing. The Contractor shall provide suitable transfer pumps and agitators necessary to accurately prepare the chemicals.

G. The sodium hypochlorite shall be placed in the well by injection through a tremie pipe. The total volume of sodium hypochlorite solution shall be injected by thirds into the bottom, middle, and top of the water column within the well. The top of the tremie pipe shall be a minimum of 20 feet below the water surface in the well as the disinfectant is emplaced.

H. After the disinfectant is emplaced, the well shall be agitated with a bailer for 2 hours.

I. After the solution has resided in the well for at least 12 hours, a volume of potable water equal to the volume of water in the well shall be pumped into the well head (estimated at 20,000 gallons).

END OF SECTION

SECTION 33 11 82
WELL HEAD

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to complete the well head.

1.2 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit a mark-up set of drawings indicating "As-Built" conditions, which shall reflect actual construction details of the well heads, including all dimensions and quantities of materials used.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. The various appurtenances shown on the DRAWINGS for the well head shall be constructed as the last section of casing is installed. This work shall include, but not be limited to, compacted backfill around the well head. The CONTRACTOR shall compact backfill around the well head sufficiently to prevent later settlement.

END OF SECTION

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SECTION 33 11 84
WELL CAPPING

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the work necessary to cap the well.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

PART 3 - EXECUTION

3.1 GENERAL

A. Upon completion of all work in connection with well construction, development, and testing, the well shall be capped by continuously welding on a minimum ¼-inch thick steel plate to the well head. The cap shall be watertight.

B. A 0.375-inch thick Low Carbon Steel (LCS) weld ring shall be installed between the 32-inch surface casing and 20-inch well casing. The weld ring shall be continuously welded to create a watertight seal. A 2-inch LCS access port nipple with a threaded cap shall be installed in the weld ring to allow for gravel pack replenishment. The location of the access port will be provided by the ENGINEER.

END OF SECTION

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SECTION 33 11 95
DRILLING FLUIDS, CUTTINGS, AND PUMPED WATER DISPOSAL

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. Work to be performed under this Section includes the labor, supplies, tools, materials, and equipment necessary to dispose all drilling fluids, drill cuttings, and water generated during borehole drilling, zone testing, well construction, well development, and well testing.

B. Costs associated with the disposal of mud/drilling fluids, and water generated during borehole drilling, well construction, well development, and well testing shall be included in the unit cost per 10,000 gallons as shown in the Bid Schedule.

C. Costs associated with the disposal of drill cuttings shall be included in the unit cost per cubic yard as shown in the Bid Schedule.

1.2 PERMITS, LAWS, AND REGULATIONS

A. The CONTRACTOR shall comply with all applicable permits, laws, and regulations in disposing of drilling fluids, drill cuttings, and water generated during drilling, well construction, well development, well testing, and disinfection. The permits, laws and regulations shall include, but not be limited to all federal, state, and local laws, regulations, and ordinances related to disposing of materials generated in constructing wells.

1.3 SUBMITTALS DURING CONSTRUCTION

A. The CONTRACTOR shall submit the following:
   1. If applicable, or requested by the ENGINEER, approved chain-of-custody form(s) demonstrating compliance with federal, state, and local laws, regulations, and ordinances related to disposing of materials generated during well construction.

B. The submittals shall be made in accordance with Part 10 of the SECTION 02 32 30 SPECIAL CONDITIONS FOR DRILLING.

PART 2 - PRODUCT

2.1 GENERAL

A. Provide all temporary and permanent materials, supplies, tools, equipment, and labor required to accomplish the work as specified.

2.2 OWNER-SUPPLIED FACILITIES

A. The OWNER will make available to the CONTRACTOR the use of an existing location to directly discharge well development water and pump test water. The locations to discharge water are shown on FIGURES. The CONTRACTOR is responsible for supplying the

transmission piping and other appurtenances to convey the water from the well to the designated discharge point.

PART 3 - EXECUTION

3.1 DRILLING FLUIDS FROM DIRECT MUD ROTARY DRILLING METHOD

A. All drill cuttings and solid materials must be transported off site for disposal. No drill cuttings or solid materials can be wasted on-site. It will be disposed offsite in accordance with applicable ordinances and regulations of governmental agencies having jurisdiction.

B. All drilling fluids, all displacement fluids generated during the well construction process, and all initial surge block and airlift development fluids shall be contained onsite in appropriate containers, such as Baker tanks, Frac tanks, or equivalent, as approved by the ENGINEER.

C. All drilling fluids and all displacement fluids generated during the construction process and all initial surge block and airlift development fluids shall be disposed by the CONTRACTOR off site at a State-Approved landfill within 5 days upon completion of surge block and airlift development. Following disposal, the CONTRACTOR shall supply the OWNER with documentation in accordance with local, state, and federal regulations to demonstrate compliance. If water quality of the drilling and development fluids is suitable in accordance with State of Utah regulation, the fluids can be discharged to the OWNER-designated location. A copy of the Fact Sheet Regarding Water Discharge from Water Well Drilling and Operation, prepared by the Utah Division of Water Quality, is located in Appendix D.

3.2 DISCHARGE WATER FROM DEVELOPMENT BY PUMPING AND WELL TESTING

A. All development and testing water shall be contained onsite in appropriate containers, such as Baker tanks, Frac tanks, or equivalent until such time water quality suitable for discharge is achieved in accordance with State of Utah regulations.

B. Solid matter will be separated from the drilling fluids and displacement fluids prior to disposal.

C. The water remaining after separation that meets State of Utah water quality standards shall be discharged to the OWNER-designated location.

D. The solid matter remaining after separation shall be removed from the site by the CONTRACTOR and disposed of offsite in accordance with applicable ordinances and regulations of governmental agencies having jurisdiction.

E. The water discharged from pump development and well testing shall be disposed via temporary pipelines provided by the CONTRACTOR. The pipelines shall have a minimum capacity to convey up to 5,000 gpm. The CONTRACTOR shall discharge water so as not to create erosion or cause turbidity in any surface water channel.

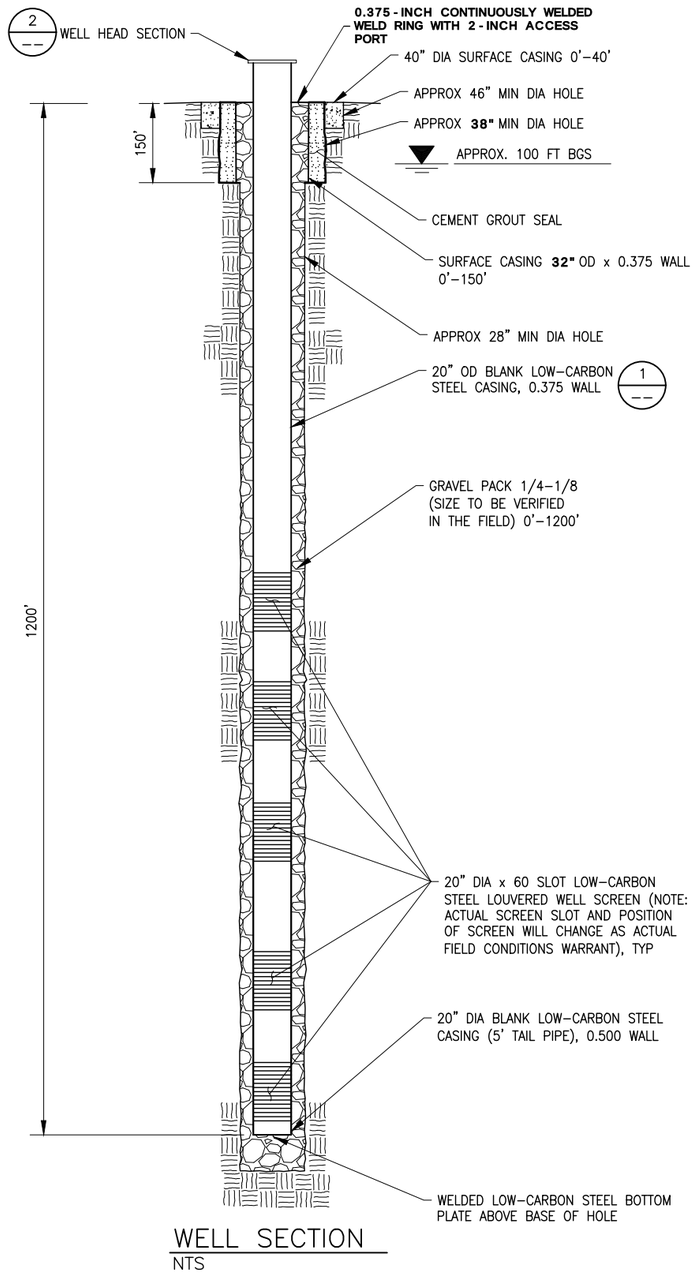
F. It is the CONTRACTOR's responsibility to prevent the discharge stream from damaging or eroding the site or drainage channel.

G. It is the CONTRACTOR's responsibility to minimize impacts to access and use of private and public road by the transmission piping and discharge stream. Use of ramps, earthen berms, or similar means for pipeline crossings of public and private accesses shall be employed. In addition, caution signs and speed restrictions shall be employed where public right-of-ways are impacted. The CONTRACTOR shall coordinate ramps and signage with the OWNER.

END OF SECTION

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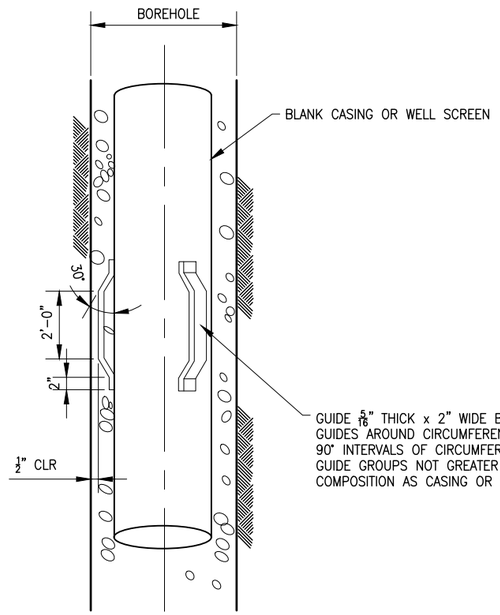
DRAWINGS



WELL SECTION
NTS

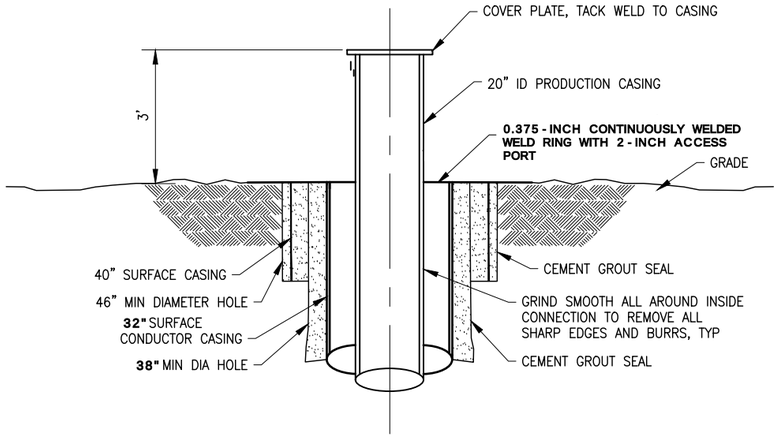
ANTICIPATE 400 FEET OF SCREEN

NOTE:
ACTUAL SCREEN SLOT SIZE AND GRAVEL PACK GRADATION WILL BE DETERMINED FROM PRODUCTION BORE HOLE DRILLING. INFORMATION ON GRAVEL PACK, SCREEN SIZE AND SCREEN INTERVALS IS GENERIC FOR BIDDING PURPOSES ONLY.



TYPICAL CASING CENTRALIZER
NTS 1

CASING AND SCREEN MATERIALS MAY VARY FROM DRAWING. MATERIALS MAY INLCUDE HIGH STRENGTH LOW ALLOY (HSLA) OR STAINLESS STEEL (SST) PER THE SPECIFICATIONS.



WELL HEAD SECTION
NTS 2

BOWEN COLLINS & ASSOCIATES

PRELIMINARY

NOT FOR CONSTRUCTION
FOR REVIEW ONLY

NO.	DATE	REV. BY	DESCRIPTION

REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

SARATOGA SPRINGS CITY
IRRIGATION WELL 9
UTAH COUNTY, UTAH

REVIEW
CHECKED C. DEKORVER
APPROVED C. DEKORVER

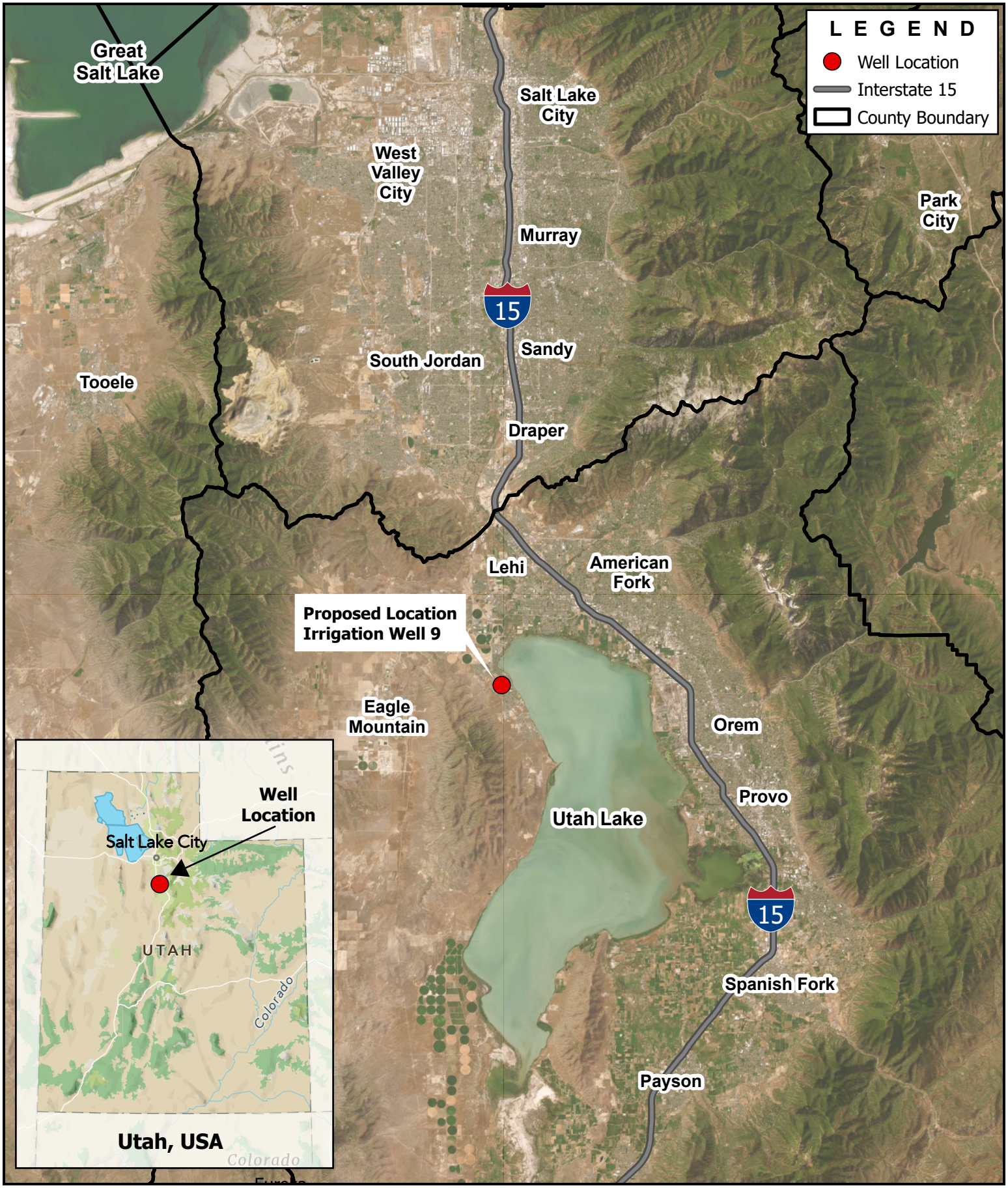
DESIGN
DESIGN C. CORDNER
DRAWN M. WASHBURN

WELL CONSTRUCTION SCHEMATIC AND DETIALS

DATE: OCTOBER 2026
PROJECT NUMBER 305-26-01

DRAWING NO.
C-01
SHEET 01 OF 01

FIGURES



BOWEN COLLINS & ASSOCIATES

LOCATION MAP

SARATOGA SPRINGS CITY

IRRIGATION WELL 9

NORTH:

SCALE: 0 3 6 Miles

FIGURE NO. 1

P:\Saratoga Springs\305-26-01 Well 9 Project\2.0 Design Phase\2.9 GIS\2.9.4 APRX\Saratoga_Springs_Well_9\Saratoga_Springs_Well_9.aprx ccordner 10/5/2026



BOWEN COLLINS & ASSOCIATES

SARATOGA SPRINGS CITY

IRRIGATION WELL 9

NEARBY WELLS

NORTH:

NORTH

SCALE:

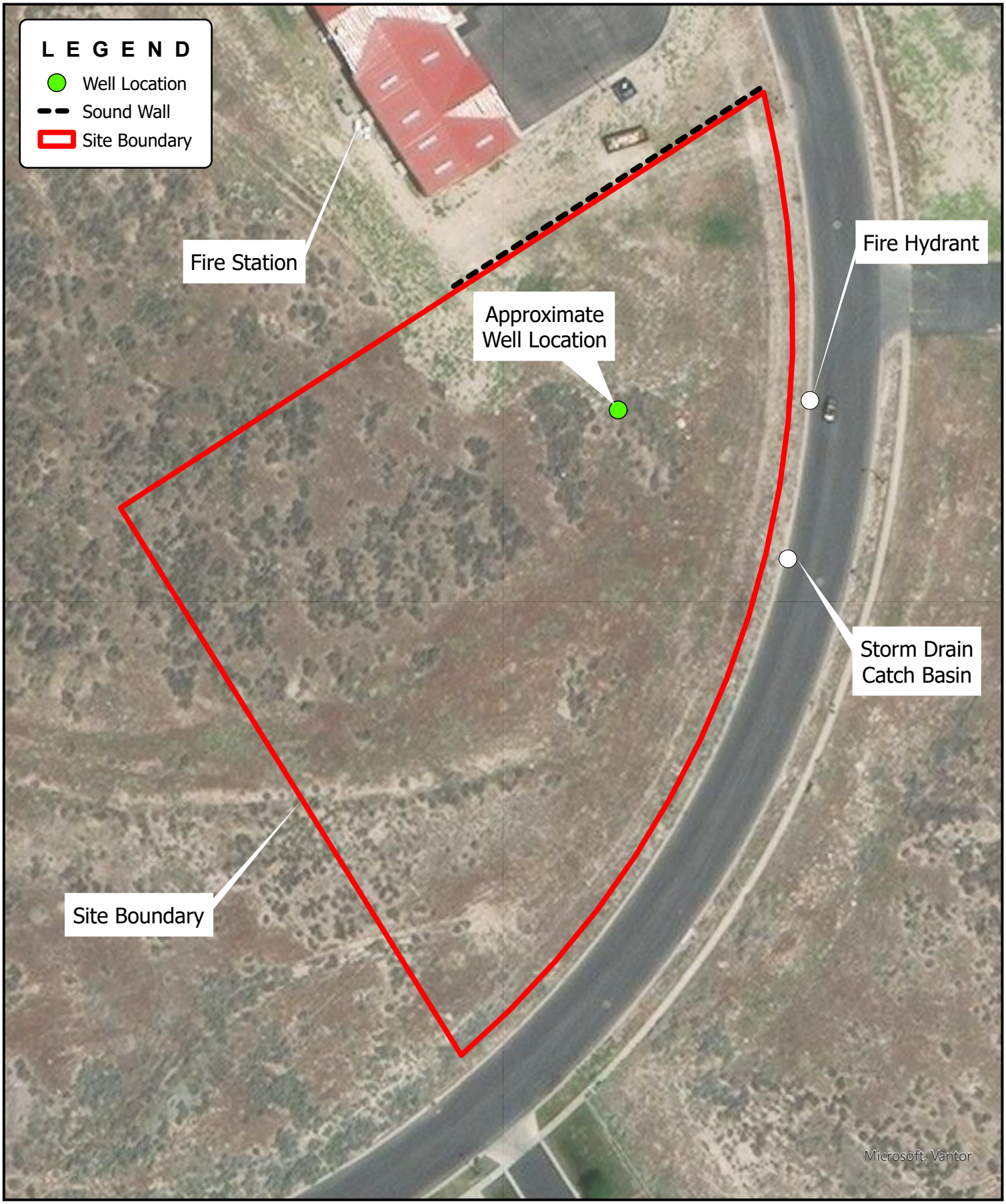
0 200 400 600 800

Feet

FIGURE NO.

2

P:\Saratoga Springs\305-26-01 Well 9 Project\2.0 Design Phase\2.9 GIS\2.9.4 APRX\Saratoga_Springs_Well_9\Saratoga_Springs_Well_9.aprx ccordner 10/5/2026



BOWEN COLLINS & ASSOCIATES

SITE MAP

SARATOGA SPRINGS CITY

IRRIGATION WELL 9

NORTH:

NORTH

SCALE:

0 25 50

Feet

FIGURE NO.

3

P:\Saratoga Springs\305-26-01 Well 9 Project\2.0 Design Phase\2.9 GIS\2.9.4 APRX\Saratoga_Springs_Well_9\Saratoga_Springs_Well_9.aprx ccordner 10/13/2026

ATTACHMENTS

ATTACHMENT A
NOISE ORDINANCE
Saratoga Springs City (Chapter 10.10.06)
Utah County (Chapter 7.12 & 8.05)

SARATOGA SPRINGS
PUBLIC WORKS

CONSTRUCTION STANDARD EXEMPTION PERMIT

Public Works Department
213 North 900 East
Saratoga Springs, UT 84045
Phone: (801) 766-6506
Fax: (801) 766-9872

ONCE APPROVED A COPY OF THIS AGREEMENT MUST BE ON SITE AT ALL TIMES

Name of Applicant: _____

Applicant Contact: (phone) _____ (email) _____

Encroachment Permit #: _____ Building Permit #: _____

Address/Location of Requested Exemption: _____

_____

Exemption Requested: (circle) Construction Operation Times / Construction Noise Level

Date(s) and Time(s) of Requested Exemption: _____

Reason for Exemption Request: _____

_____

State what measures will be taken to minimize the impact to the area(s) surrounding the exemption: _____

_____

_____

SIGNATURE

Applicant Name: _____ Date: _____

Applicant Signature: _____

CITY OFFICE USE ONLY

Application Date: _____ Date Issued: _____

Permit #: _____ Issued By: _____

CITY CODE

10.10.06. Noise.

1. **Unlawful Noise.** It shall be unlawful for any person or group to cause, permit, maintain, or allow the creation of any noise disturbance including the following situations or conditions:
    a. Any horn or signaling device sounded on any truck, automobile, or motorcycle except to signal or warn of danger as provided in the Vehicle Code of the State of Utah.
    b. Any motor vehicle operated without an exhaust system equipped with a muffler or other noise dissipative device.
    c. Any construction work performed on any construction site in a residential zone, including construction traffic, between the hours of 10 p.m. through 7 a.m. or before 9 a.m. on Sundays. In all other zones, it shall be unlawful to perform or cause to be performed, construction work between the hours of 10 p.m. through 6
    a.m. The Building Official or City Engineer may authorize extended hours for the construction operations or procedures that, by their nature, require continuous operation, for public improvement projects, or for projects in isolated areas where the extended hours do not impact upon adjoining property owners.
    d. Any power equipment operated in residential or commercial zones, including: power saw, sander, lawn mower, garden equipment, or snow removal equipment between the hours of 10 p.m. through 7 a.m. or before 9 a.m. on Sundays.
    e. Any recreational vehicle, watercraft, or snowmobile operated during the hours of 10 p.m. through 7 a.m. or before 9 a.m. on Sundays.

2. **Noise Levels.** It shall be unlawful for any person to group or cause, permit, maintain, or allow the creation of any noise that is in excess of 65 decibels measured by a sound level meter at a distance of at least twenty-five feet from the source, if upon public property, or twenty-five feet from the property line if the noise is resonating on private property. The following noise shall be exempt from this ordinance:
    a. Any noise from safety signals or warning devices.
    b. Any noise resulting from any authorized emergency vehicle when responding to an emergency call or in time of an emergency.
    c. Any noise resulting from any authorized emergency work.
    d. Any noise resulting from lawful fireworks and noisemakers used for celebration of an official holiday including any City sponsored event.
    e. Any noise resulting from the maintenance of City parks.
    f. Any noise resulting from snow plowing or removal services.

3. **Suspending of Noise Restrictions.** Requests for suspending the noise restrictions in this Section may be made and granted by the City Council. Upon the City Council granting relief, any condition outlined and agreed upon shall be complied with by the applicant; otherwise, this Section shall be in full force.

4. **Enforcement of Noise Nuisances.** The City Inspector or law enforcement personnel shall be responsible for the administration of the noise portion of this ordinance.

(Ord. 17-19; Ord. 12-9)

7.12 Unreasonable Noise
7.12.010 Declaration Of Intent, Policy, And Scope
7.12.020 Definitions
7.12.030 Excessive Sound Levels
7.12.040 Monitoring And Enforcement
7.12.050 Violations

7.12.010 Declaration Of Intent, Policy, And Scope

It is declared to be the intent of the County, in the exercise of its police power, to prohibit unnecessary, excessive and annoying sound levels from all sources where such will negatively impact users of adjoining property. At certain levels, sounds are detrimental to the health and welfare of the citizenry, and, in the public interest, shall by systematically proscribed. It is the purpose of this chapter to prescribe standards for and to provide an effective and readily available remedy for violations of this chapter. The provisions of this chapter and the remedies contained herein shall be cumulative and are not intended to replace any otherwise available remedies for public, private, or mixed nuisance, or any other civil or criminal remedies available. The scope of the provisions of this chapter shall be the unincorporated area of the County.

7.12.020 Definitions

All terminology used in this chapter and not elaborated upon in the definitions in this section shall be in conformance with applicable American National Standards Institute publications. For the purpose of the administration and enforcement of this chapter, certain words and phrases are defined as follows:

"Cyclically varying noise" means any sound which varies in sound level so that the same level or nearly the same level of sound is obtained repetitively at spaced intervals of time. Example: Back-up beeper on heavy equipment.

"Decibel" means the customary logarithmic and dimensionless unit of measures used in describing the amplitude of sound. Decibel is abbreviated herein as "dB".

"Impulse noise" means a noise with a duration of two (2) seconds or less. Example: a gunshot.

"Intermittent noise" is a noise similar to a cyclically varying noise but with an irregular interval and a continuous duration of six (6) minutes or less for high level sound levels. Example: a motor vehicle passing a fixed location

"Noise Source" means any instrument or device for amplifying sound, or anything which produces, reproduces, or amplifies sound. The term shall include multiple sources of sound.

"Sound pressure level" means the sound level measured with a sound level meter using the A-weighting network. The standard notation or abbreviation is "dB(A)".

7.12.030 Excessive Sound Levels

A. Except as provided in Subsections E or F of this section, no person shall do any of the following which makes sound in excess of the levels specified in this section:
    1. operate any type of vehicle, machine, instrument, or other device;
    2. carry on any activity; or
    3. promote or facilitate the carrying on of any activity.

B. Sound from a moving vehicular source operated on a public right-of-way shall not exceed eighty decibels on the A-weighting scale (80 dB(A)), as measured at a distance at least twenty-five feet (25') from said vehicle located in the right-of-way.

1. **Exception**: The maximum sound level shall be eighty-eight decibels (88 dB(A)) for vehicles on State Highways and on county roads adopted by a resolution of the County Commission as arterial roads.

C. Sound from any source, other than a vehicle operated on a public right-of-way, shall not exceed the levels stated in the table below when measured off-site (meaning measured upon the property owned by someone other than the owner of the property from which the sound was emitted). The zone designations refer to the zoning districts as identified in Chapter 4 of the Utah County Zoning Ordinance and on the Utah County Zone Map.

1. The limits in each zone prescribed by this section are set forth in the following table:

Zoning district in which the property lies were the sound is received	**Maximum number of decibels (dB(A)) permitted between the hours of 7:00 a.m. and 10:00 p.m.**	**Maximum number of decibels (dB(A)) permitted between the hours of 10:00 p.m. and 7:00 a.m.**
Residential Zones: RA-5, RR-5, TR-5, and CE-2	55 dB(A)	50 dB(A)
Commercial Zones: NC-1 and HS-1	65 dB(A)	60 dB(A)
Industrial & Other Zones: I-1, CE-1, M&G-1, and A-40	80 dB(A)	80 dB(A)

2. **Exception**: Sound from construction work at a site for which a current building permit has been issued and is in effect shall be deemed to be received in an industrial district during the hours of 7:00 a.m. to 10:00 p.m. Under no circumstances shall amplified sound be considered as construction work activity, nor shall the period of this exception exceed one (1) year.

3. **Sound from a source regulated by this subsection**:

a. Sound from a source on private property shall be measured at or inside the property line of property owned by a person or entity other than the person or entity owning the property on which the sound is produced.

b. Sound from a source on public parks, County-approved shooting ranges, or other public property (other than roads, which are treated in Subsection B) shall be measured at a distance of twenty-five (25) feet from the source of the sound, or at the property line or inside the property which adjoins the public property.

4. For the purposes of this subsection, a leasehold shall be deemed a property and its boundary shall be deemed a property line.

D. All sound measurements shall me made on a sound level meter which meets ANSI specification S 1.4-1974 for Type I or Type II equipment. The manufacturer's published indication of compliance with such specifications is prima facie evidence of compliance with this subsection.

E. It is a specific defense to a charge of violating this chapter that:

1. the sound was made by an authorized emergency vehicle which was responding to a call or acting in time of emergency;
2. the sound was made within the terms of a temporary event such as a parade, fireworks display, or other event for which a permit and exemption was issued by the County Commission as being in the public interest, and the conditions of such permit were being complied with;
3. the sound was made by farm animals or by the normal day or night operation of farm equipment;
4. the sound was made by the sounding or a horn of a vehicle as a warning signal of imminent danger or the sounding of any warning device required by law;
5. the sound was made on property owned by the Federal or state and was made by an activity of that governmental entity (or those under contract with the Federal or state government to carry out such activity); or
6. the sound was made under the auspices of a variance issued by the County Commission or its designee to grant noise ordinance variances, and was made within the terms and conditions of such variance. To grant a variance the County Commission or the designee must find:
    a. the facts of the specific variance will result in no undue harm or loss to other parties;
    b. the best available sound control technologies have been employed and the sound still exceeds the standards stated above;
    c. no reasonable alternative exists for person or entity producing the sound; and
    d. conditions or mitigation measures are required as a part of the variance approval which are sufficient to protect the interests of the public.

F. The following existing shooting ranges are specifically exempted from the restrictions and violations contained in this chapter:
    1. Utah County Shooting Range, 12771 S. (6431 E.) US Highway 89;
    2. Western Range Management Range, 395 S. 18159 W.;
    3. Utah Division of Wildlife Resources/Pacific States Rifle Club Shooting Range, 4896 E. Hobble Creek Canyon Road;
    4. Goshen Dam Sporting Clays Shotgun Shooting Range, 11209 W. US Highway 6;
    5. Beer Creek Farms Shotgun Shooting Range, 5500 W. 6400 W; and
    6. Wild Wings Hunting & Sporting Clays Club Shooting Range, 3446 S. 200 W.

7.12.040 Monitoring And Enforcement

The Utah County Community Development Department is appointed to monitor compliance with the provisions of this chapter. Either department personnel or contractors doing building inspection or other work for the department may perform the monitoring work. If a violation of the provisions this chapter is discovered during monitoring activities, the Director of Community Development or designee may refer the matter to the County Attorney for legal action.

7.12.050 Violations

A. Each offense of violation of this chapter constitutes a separate and distinct violation. For a continuous sound, each day of violation of this chapter constitutes a separate and distinct violation.

B. Violations shall be a class B misdemeanor. The County Attorney may also seek civil action to abate or enjoin the violation, or to obtain whatever other remedy or penalty the Court may deem appropriate.

8.05 Excavations
8.05.010 In General
8.05.020 Permit
8.05.030 Performance Standards In Addition To Utah County Development Standards

8.05.010 In General

A. **Definitions**: For the purposes of this chapter the following words and phrases shall have the meanings respectively ascribed to them.

"Excavation" means any opening in the surface of a public place made in any manner whatsoever, except an opening into a lawful structure below the surface of a public place, the top of which is flush with the adjoining surface and so constructed as to permit frequent openings without injury or damage to the public place.

"Facility" means pipe, pipeline, tube, main, service, trap, vent, vault, manhole, meter, gauge, regulator, valve, conduit, wire, tower, pole, pole line, anchor, cable, junction box, transformer, or any other material, structure of object of any kind or character, whether enumerated herein or not, which is or may be lawfully constructed, left, placed or maintained in, upon, along, across, under or over any public place.

"Public place" means any public street, way, place, alley, sidewalk, park, square, plaza, or any other similar public property controlled by the County and dedicated to public use.

"Substructure" means any pipe, conduit, duct, tunnel, manhole, vault, buried cable or wire, or any other similar structure located below the surface of any public place.

"Utility" means a private company and/or corporation or municipal department engaged in providing a particular service to the general public.

B. **Enforcement**: The County Engineer shall make such inspections as are reasonably necessary in the enforcement of this chapter. The County Engineer shall have the authority to promulgate and cause to be enforced such rules and regulations as may be reasonably necessary to enforce and carry out the intent of this chapter. All work shall be performed in accordance with the procedures prescribed in the "Utah County Development Standards."

C. **Liability of County**: The provisions of this chapter shall not be construed as imposing upon the County or any official or employee thereof any liability or responsibility for damages to any person injured by the performance of any excavation work for which an excavation permit is issued hereunder; nor shall the County or any official or employee thereof be deemed to have assumed any such liability or responsibility by reason of inspections authorized here under the issuance of any permit or the approval of any excavation work.

D. **Maintenance of drawings**: Every person owning, using, controlling, or having an interest in substructures under the surface of any public place used for the purpose of supplying or conveying gas, electricity, communication impulse, water, steam, ammonia or oil in the county, shall file with the County Engineer (or have available upon request) a map or set of maps each drawn to scale showing in detail the plan location, size and kind of installation, if known, of all substructures, except service lines designed to serve single properties beneath the surface of the public place belonging to, used by or under the control of such person having any interest, and shall file with the County Engineer annually at a time specified by him, a corrected map or set of maps each drawn to scale including all installations made during the previous year to and including the last day of such year; provided, however, that a public utility owner may at its option provide corrected atlas sheets at more frequent intervals.

E. **Emergency action**: Nothing in this chapter shall be construed to prevent the making of such excavations as may be necessary for the preservation of life or property or for the location of trouble in conduit or pipe, or for making repairs, provided that the person making such excavation shall apply to the County Engineer for such a permit on the first working day after such work is commenced.

8.05.020 Permit

A. **Required**: No person shall make any excavation or fill any excavation in any public place without first obtaining a permit to do so from the County Engineer except as otherwise provided in this chapter.

B. **Annual permits**: The County Engineer may issue an annual blanket permit for the purpose of placing, replacing, or repairing any facility within a public place and other miscellaneous excavations approved by the County Engineer to the following:

1. a public utility regulated by the Public Utilities Commission of the State;
2. a person holding a franchise from the County; and
3. the water, electric and sewer departments of the County.

C. **Application**: No excavation permit shall be issued unless a written application for the issuance of an excavation permit is submitted to the County Engineer. The written application shall state the name and address of the applicant, the location and dimensions of the installation or removal and the approximate size of the excavation to be made, the purposes of the facility, including backfilling said excavation and removing all obstructions, materials and debris.

D. **Fee—issuance**: The application for a permit required by the provisions of this section, with the payment of a fee specified in the Utah County Government Fee Schedule when approved by the County Engineer, shall constitute and be deemed issuance of the required permit. The fee shall be doubled if excavation commences before a permit is issued except as provided in UCC 8.05.010 Subsection D.

E. **Deposits—When required**:

1. The application for an excavation permit to perform excavation work under this chapter shall be accompanied with a cash deposit made to the County at the rate specified in the Utah County Government Fee Schedule.
2. Where excavations are made by public utility companies operating under a franchise issued by the County or under the supervision of the public utilities commission of utilities operated by governmental agencies, a permit may be granted without making such deposit.

F. **Deposits—Use**: The County Engineer may use any or all of any deposits required by this section to pay the cost of any work the Public Works Department performs to restore or maintain the public place as herein provided in the event the permittee fails to perform such work in which the amount refunded to the permittee shall be reduced by the amount thus expended by the County Engineer.

8.05.030 Performance Standards In Addition To Utah County Development Standards

A. **Barriers and warning devices required**:

1. It shall be the duty of every person cutting or making an excavation in or upon any public place to place and maintain barriers and warning devices necessary for safety of the

general public.

2. Barriers, warning signs, lights, etc., shall conform to the requirements of the County Engineer. Warning lights shall be flares, torches, lanterns, electrical markers or flashers used to indicate a hazard to traffic from sunset of each day to sunrise of the next day. Torches shall be open wick or flame flares or bombs generally used in connection with roadway repairs or construction and operating on kerosene or a similar fluid. Lanterns shall burn kerosene or a similar fluid and have clear red or ruby globes. Electrical markers or flashers shall emit light at sufficient intensity and frequency to be visible at a reasonable distance for safety. Reflectors or reflecting material may be used to supplement, but not replace, light sources. The County Engineer may restrict the use of lantern or open flame devices in fire hazard areas.

B. **Traffic conditions to be maintained**: The permittee shall take appropriate measures to assure that during the performance of the excavation work, traffic conditions as near normal as possible shall be maintained at all times so as to minimize inconvenience to the occupants of the adjoining property and to the general public.

C. **Closing of streets and alleys**: When traffic conditions permit, the County Engineer may, by written approval, permit the closing of streets and alleys to all traffic for a period of time prescribed by the County Engineer if in the County Engineer's opinion it is necessary. The written approval of the County Engineer may require that the permittee give notification to various public agencies and to the general public. In such cases, such written approval shall not be valid until such notice is given.

D. **Warning signs**: Warning signs shall be placed far enough in advance of the construction operation to alert traffic within a public street, and cones or other approved devices shall be placed to channel traffic in accordance with the instructions of the County Engineer.

E. **Relocation and protection of utilities**: The permittee shall not interfere with any existing facility without the written consent of the County Engineer and the owner of the facility. If it becomes necessary to relocate an existing facility this shall be done by the owner. No facility owned by the County shall be moved to accommodate the permittee unless the cost of such work be borne by the permittee. The cost of moving privately owned facilities shall be similarly borne by the permittee unless it makes other arrangements with the person owning the facility. The permittee shall support and protect by timbers or otherwise all pipes, conduits, poles, wires or other apparatus which may be in any way affected by the excavation work, and do everything necessary to support, sustain and protect them under, over, along or across said work. The permittee shall secure approval of method of support and protection from the owner of the facility. In case any of said pipes, conduits, poles, wires or apparatus should be damaged, and for this purpose pipe coating or other encasement or devices are to be considered as part of a substructure, the permittee shall promptly notify the owner thereof. All damaged facilities shall be repaired by the agency or person owning them and the expense of such repairs shall be charged to the permittee. It is the intent of this subsection that the permittee shall assume all liability for damage to facilities and any resulting damage or injury to anyone because of such facility damage and such assumption of liability is a contractual obligation of the permittee. The only exception will be such instances where damage is exclusively due to the negligence of the owning utility. The County shall not be made a party to any action because of this subsection. The permittee shall inform itself as to the existence and location of all underground facilities and protect the same against damage.

F. **Protection of adjoining property**: The permittee shall at all times and at the permittee's own expense preserve and protect from injury any adjoining property by providing proper foundations and taking other measures suitable for the purpose. Where in the protection of such property it is necessary to enter upon private property for the purpose of taking appropriate protecting measures, the permittee shall obtain a license from the owner of such private property for such

purpose and if he cannot obtain a license from such owner the County Engineer may authorize the permittee to enter the private premises solely for the purpose of making the property safe. The permittee shall, at the permittee's own expense, shore up and protect all buildings, walls, fences or other property likely to be damaged during the progress of the excavation work and shall be responsible for all damage to public or private property or highways resulting from its failure properly to protect and carry out said work. Whenever it may be necessary for the permittee to trench through any lawn area, said area shall be reseeded or the sod shall be carefully cut and rolled and replaced after ditches have been backfilled as required in this chapter. All construction and maintenance work shall be done in a manner calculated to leave the lawn area clean of earth and debris and in a condition as nearly as possible to that which existed before such work began. The permittee shall not remove, even temporarily, any trees or shrubs which exist in parking strip areas without first obtaining the consent of the appropriate County department or County official having control of such property.

G. **Protection of watercourses**:

1. The permittee shall maintain all gutters free and unobstructed for the full depth of the adjacent curb and for at least one (1) foot in width from the face of such curb at the gutterline. Whenever a gutter crosses an intersecting street, an adequate waterway shall be provided and at all times maintained.
2. The permittee shall make provisions to take care of all surplus water, muck, silt, slickings, or other runoff pumped from excavations or resulting from sluicing or other operations. The permittee shall be responsible for any damage resulting from its failure to so provide.
3. The permittee shall make provisions to maintain existing irrigation ditches to assure continuity of water rights in the area of excavations.

H. **Care of excavated material**:

1. All material excavated from trenches and piled adjacent to the trench or in any street shall be piled and maintained in such manner as not to endanger those working in the trench, pedestrians or users of the streets, and so that as little inconvenience as possible is caused to those using streets and adjoining property. Where the confines of the area being excavated are too narrow to permit the piling of excavated material beside the trench, such as might be the case in a narrow alley, the County Engineer shall have the authority to require that the permittee haul the excavated material to a storage site and then rehaul it to the trench site at the time of backfilling. It shall be the permittee's responsibility to secure the necessary permission and make all necessary arrangements for all required storage and disposal sites.
2. All material excavated shall be laid compactly along the side of the trench and kept trimmed so as to cause as little inconvenience as reasonably possible to vehicular and pedestrian traffic, or as specified by the County Engineer. Whenever necessary, in order to expedite the flow of traffic or to abate the dirt or dust nuisance, toe boards or bins may be required by the County Engineer to prevent the spreading of dirt into traffic lanes.

I. **Cleanup**: As the excavation work progresses, all streets shall be thoroughly cleaned of all rubbish, excess earth, rock and other debris resulting from such work. All cleanup operations at the location of such excavation shall be accomplished at the expense of the permittee and shall be completed to the satisfaction of the County Engineer. From time to time, as may be ordered by the County Engineer and in any event immediately after completion of said work, the permittee shall, at the permittee's own expense, clean up and remove all refuse and unused materials of any kind resulting from said work.

J. **Breaking through pavement**:

1. Heavy-duty pavement breakers may be prohibited by the County Engineer when the use endangers existing substructures or other property.
2. Approved cutting of bituminous pavement surface ahead of excavations may be required by the County Engineer to confine pavement damage to the limits of the trench.
3. Unstable pavement shall be removed over cave-outs and over-breaks and the subgrade shall be treated as the main trench.
4. Pavement edges shall be trimmed to a vertical face and neatly aligned with the center line of the trench.
5. Cutouts outside of the trench lines must be normal or parallel to the trench line.
6. Boring or other methods to prevent cutting of new pavement shall be used whenever possible.
7. The permittee shall not be required to repair pavement damage existing prior to excavation unless his cut results in small floating sections that may be unstable, in which case the permittee shall remove and pave the area.

K. **Backfilling**: All backfilling shall be accomplished in accordance with the Utah County Development Standards.

L. **Restoration of surface by permittee**: Immediately upon completion of the backfilling, temporary resurfacing of an excavation within a public place for the installation or removal of substructures must be completed. The County Engineer may require the permittee to permanently resurface that portion of the street surface damaged by the permittee's excavation, in which event resurfacing shall be of the same type and depth of existing pavement, however, asphalt shall not be less than two (2) inches in thickness and shall be subject to the inspection of the County Engineer, and shall be completed within a period of fourteen (14) days except where temporary resurfacing is placed or weather conditions do not permit immediate placement of permanent pavement.

M. **Restoration of surface by County**: With respect to hard-surface roads, permanent resurfacing of excavations shall be required by the County Engineer. The paved surface of the backfill shall be covered with one (1) inch of bituminous temporary resurfacing material by the permittee where the backfill is whipped out by traffic. Such temporary paving material shall be cold mix, except that the permittee may use, or the County Engineer may require, hot mix. All temporary paving material shall conform closely enough to the level of the adjoining paving surface and shall be compacted so that it is hard enough and smooth enough to be safe for pedestrian travel over it as well as for vehicular traffic to pass safely over it at a legal rate of speed. The permittee shall maintain temporary paving for a period not exceeding fourteen (14) days after all backfilling is completed unless additional time is required by the County Engineer during cold weather, and shall keep the same safe for pedestrian and vehicular traffic until the excavation has been resurfaced with permanent paving by the Public Works Department, except that if it is not possible to maintain the surface of the temporary paving in a safe condition for pedestrian travel or vehicular traffic, then the permittee shall maintain barriers and lights where required herein.

N. **Maximum length of open trench**: The maximum length of open trench permissible at any time shall be in accordance with existing ordinances or regulations or as may be specified by the County Engineer and no greater length shall be open for pavement removal, excavation, construction, backfilling, patching and all other operations without the written permission of the County Engineer.

O. **Prompt completion of work**: After an excavation is commenced, the permittee shall prosecute with diligence and expediency all excavation work covered by the excavation permit and shall

promptly complete such work and restore the street to its original condition, or as near as may be, so as not to obstruct the public place or travel thereon more than is reasonably necessary.

P. **Noise, dust, and debris**: Each permittee shall conduct and carry out excavation work in such a manner as to avoid unnecessary inconvenience and annoyance to the general public and occupants of neighboring property. The permittee shall take appropriate measures to reduce to the fullest extent practicable in the performance of the excavation work, noise, dust and unsightly debris, and between the hours of 10:00 p.m. and 7:00 a.m. shall not use except with the express written permission of the County Engineer or in the case of an emergency as herein otherwise provided, any tool, appliance or equipment producing noise of sufficient volume to disturb the sleep or repose of occupants of the neighboring property.

Q. **Preservation of monuments**: Any monument set for the purpose of locating or preserving the lines of any street or property subdivision, or a precise survey reference point, or a permanent survey benchmark within the county shall not be removed or disturbed or caused to be removed or disturbed without first obtaining permission in writing from the County Surveyor to do so. Permission to remove or disturb such monuments, reference points or benchmarks shall only be granted upon condition that the person applying for such permission shall pay all expenses incident to the proper replacement of this monument by the County Surveyor.

ATTACHMENT B
NEARBY WELL LOGS

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

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

RECEIVED
SEP 12 2005
WATER RIGHTS
SALT LAKE

Well Identification

Non-Production Well: 0554001M00 54-1278 a37898

WIN: 33628

Owner *Note any changes*

THE CITY OF SARATOGA SPRINGS
2015 S. REDWOOD ROAD
SARATOGA SPRINGS, UT 84043

Contact Person/Engineer: _____

Well Location *Note any changes*

N 626 W 1186 from the SE corner of section 02, Township 6S, Range 1W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: 3-3-05 Completion Date: 8-26-05

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use: SECONDARY WATER WELL

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
0	65	42	AUGER	NONE
65	520	24	REVERSE CIRCULATION	POLYMER/BENT. FLUID
520	1094	17.5	REVERSE CIRCULATION	POLYMER/BENT. FLUID

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
0	1094													PLEASE SEE ATTACHED LITHOLOGIC LOG.

Static Water Level

Date 5/22/05 Water Level 247 feet Flowing? [ ] Yes [X] No

Method of Water Level Measurement AIRLINE If Flowing, Capped Pressure _____ PSI

Point to Which Water Level Measurement was Referenced GROUND LEVEL Elevation _____

Height of Water Level reference point above ground surface _____ feet Temperature _____ degrees [ ] C [ ] F

Well Log

Construction Information

DEPTH (feet) FROM	TO	CASING: CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)
0	65	STEEL A53 B	.375	36
0	520	STEEL A53B	.375	18

DEPTH (feet) FROM	TO	☐SCREEN ☐PERFORATIONS ☒OPEN BOTTOM: SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
520	1094	OPEN HOLE COMPLETION		

Well Head Configuration: WELDED CAP ON 18" CASING Access Port Provided? ☐Yes ☒No

Casing Joint Type: BEVEL WELDED Perforator Used:

Was a Surface Seal Installed? ☒Yes ☐No Depth of Surface Seal: 120 feet Drive Shoe? ☐Yes ☒No

Surface Seal Material Placement Method: CONCRETE PUMP

Was a temporary surface casing used? ☐Yes ☑No If yes, depth of casing: _____ feet diameter: _____ inches

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	Quantity of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	120	GROUT SEAL		13 bag mix
120	366	FORMATION STABILIZER	PEA GRAVEL	
495	520	BENTONITE SEAL	PELLETTS	
366	495	GROUT SEAL		13 bag mix

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
5/22/05	TEST PUMPING	3800	X		26	24 hr

Pump (Permanent)

Pump Description: NONE INSTALLED Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? ☑Yes ☐No

Comments

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

DIFFICULT DRILLING CONDITIONS

LOSS OF CIRCULATION IN FRACTURED LIMESTONE.

Well Driller Statement

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

Name LAYNE CHRISTENSEN COMPANY (Person, Firm, or Corporation - Print or Type) License No. 188

Signature Larry G Knoll (Licensed Well Driller) Date Sept 9, 2005

ATTACHMENT B

RECEIVED
SEP 12 2005
WATER RIGHTS
SALT LAKE

Jacob's Ranch Well No. 1
City of Saratoga Springs
Lithologic Log
Sample Interval: 10 feet
Robert J. Starkey, Ph.D., P.G., Weston Engineering, Inc.
Colors Determined by Comparison to the Geologic Society of America Rock Color Chart

Interval (feet)	Description (lithologies are given in decreasing order of abundance)
	Drilling with a 42-inch bit for surface casing
0 – 65	No sample; surface rocks are mapped as fanglomerate consisting of unconsolidated gravel, sand, silt and clay (Davis, 1983)
	Great Blue Limestone
	Drilling with a 17 1/2-inch bit using a flooded reverse method
65 – 70	Gray-black, finely crystalline limestone containing fractures healed with white calcite (veinlets); very dusky red and yellow-brown, finely crystalline limestone; grade is medium pebble to medium sand; note that grade is related to drilling characteristics not to grain size of the formation; caliper log indicates a washout at 65 feet (base of surface casing)
70 – 100	Yellow-brown and gray-black, finely crystalline limestone; grade is as above; caliper log indicates washouts in this interval
100 – 110	As above but grade is very fine to medium pebble
110 – 120	As above with white calcite
120 – 130	As above with moderate red, crystalline, bedded limestone
130 – 150	Gray-black, yellow-brown, and moderate red crystalline limestone with very pale orange clay (10%); grade is medium pebble to medium sand
150 – 160	Gray-black and yellow-brown, finely crystalline limestone with white calcite; grade is fine pebble to medium sand; hole deviation is 0.4 degrees at 158 feet; gamma log shows a clay response at 159 feet
160 – 180	Lithology as above with 15% brown clay; grade is medium pebble to coarse sand; gamma log shows a clay response at 180 feet
180 – 210	Gray-black, yellow-brown, minor moderate red, finely crystalline limestone with white calcite veinlets; grade is as above; caliper log shows a washout from 180 to 188 feet
210 - 220	Gray-black limestone with white calcite veinlets; grade is as above
220 – 230	As above with pale orange, crystalline limestone
230 – 250	Brown-black and very dusky red crystalline to micritic, bedded limestone with 5 to 10% yellow-brown clay; grade is fine pebble to medium sand; hole deviation is 0.4 degrees at 249 feet; sonic log indicates the water level is 240 feet

250 – 280	Brown-black to gray-black, finely crystalline limestone with white calcite; 10% brown clay; grade is medium pebble to coarse sand
280 – 290	Gray-black, crystalline limestone and 15% pale red-brown clay; grade is medium pebble to coarse sand; gamma log shows clay response at 285 feet
300 – 310	Olive-brown and gray-black, bedded limestone with white calcite; grade is medium pebble to coarse sand; gamma log shows a clay response at 306 feet; drill stuck briefly at 305 feet
310 – 320	Yellow clay and minor gray-black crystalline limestone with white calcite; gamma log show a clay response over this interval
320 – 330	Gray-black, crystalline limestone with abundant white to pale yellow-orange vein calcite; grade is very coarse sand; increased drilling fluid loss from 322 to 323 feet; caliper log shows a small washout at 324 feet
330 – 360	Limestone as above; minor moderate red silty limestone; grade is fine pebble to medium sand; deviation is 0.2 degrees at 339 feet
360 – 370	As above with brown-gray limestone
370 – 390	Gray-black, bedded, crystalline limestone with white to pale orange-yellow vein calcite; minor moderate red, silty limestone; grade is medium pebble to coarse sand
390 – 430	As above but bedding is undeveloped (massive); deviation is 0.3 degrees as 430 feet
430 – 440	As above with 10% gray clay; caliper log shows a washout or fracture at 432 feet
440 – 450	Gray-black and moderate red, massive limestone with white to pale yellow-orange vein calcite; grade is medium pebble to coarse sand; driller noted possible fractures from 445 to 450 feet; gamma log shows a clay response at 446 feet
450 – 460	Gray-red, silty limestone, gray-black, crystalline limestone with white calcite; grade is as above; caliper log indicates a washout or fractured interval from 450 to 460 feet
460 – 470	As above with 20% gray-red clay; gamma log shows a clay response from 466 to 468 feet
470 – 520	Gray-black, massive, crystalline limestone with white calcite veinlets and fracture surfaces coated with red-brown iron oxide; grade is medium pebble to coarse sand; driller noted rough drilling at 479 feet and from 483 to 495 feet
520 – 530	As above with black, carbonaceous, massive limestone; deviation is 0.4 degrees at 521 feet
530 – 560	Black, carbonaceous, massive, crystalline limestone with veinlets of white calcite and fracture surfaces coated with red-brown iron oxide; grade is medium pebble to coarse sand; driller noted a fracture from 554 to 555 feet
560 – 570	As above with gray-red, massive crystalline limestone; driller noted fracture at 565 feet

570 – 670	Black and minor medium dark gray, massive limestone with veinlets of white calcite and fractures coated with red-brown iron oxide; trace of yellow clay; grade is medium pebble to coarse sand; driller noted fractures at 576 to 578, 603 to 606, 645, 650 to 651, and 655 foot intervals; gamma log shows increasing clay response below 654 feet; deviation at 581 and 611 feet is 1.5 degrees
670 - 680	Black, carbonaceous, crystalline, massive limestone with white to pale yellow vein calcite; moderate red, oxidized, crystalline limestone; grade is as above; deviation 671 feet is 1.6 degrees; caliper log shows a cavern from 674 to 682 feet
680 – 720	Dark gray to medium gray and gray-red, crystalline limestone; white to moderate red-orange calcite; grade is as above; driller noted a fracture at 690 feet and a large loss of drilling fluid at 710 feet; deviation 702 feet is 2.2 degrees; gamma log indicates a clay-rich interval from 680 to 700 feet
720 – 730	Dark gray, massive, crystalline limestone with white calcite; grade is as above
730 – 740	Dark gray to gray-red, massive, crystalline limestone with white calcite; grade is as above; deviation is 2.4 degrees at 732 feet
740 – 760	Dark brown-gray, dark gray, and gray-red, massive crystalline limestone; white calcite; grade is as above
760 – 770	Dark brown-gray, dark gray, and gray-red, weakly bedded, crystalline limestone; white calcite; medium gray to olive-gray, medium to fine-grain, calcite-cemented, rounded quartz sandstone; grade is as above; deviation is 2.2 degrees at 762 feet
770 – 780	Olive-gray, red-gray, dark gray, weakly bedded crystalline limestone with white to yellow-orange calcite; moderate red, medium-grain, rounded, calcareous sandstone; light gray, silty, fine-grain, calcareous sandstone; gamma log shows elevated clay response; driller noted a fractured interval from 777 to 779 feet concurrent with a large loss of drilling fluid
780 – 790	Gray-red, medium gray, dark gray, and olive-gray, massive, crystalline limestone; red-orange and white calcite; 5% red-orange clay; grade is medium pebble to coarse sand (except for clay); driller noted rough drilling at 784; deviation is 2.2 degrees at 793 feet
790 – 800	Gray-red, minor dark gray, massive, finely crystalline limestone; light red-orange calcite; trace red-orange clay; grade is as above (except for clay)
800 – 810	As above with fractures healed with white and minor olive-brown calcite
810 – 820	Gray-red, minor black, crystalline limestone; grade is medium pebble to coarse sand
820 – 850	As above with white to pale yellow calcite and 5% red-orange clay; deviation at 823 feet is 1.5 degrees

850 – 880 Gray-red and black, weakly bedded to massive, crystalline limestone with 5% red-orange clay; black limestone abundance increases downward as gray-red and clay abundance decreases downward; grade is as above; gamma log shows elevated clay responses at 859, 866 to 869, and 872 to 875 feet; deviation at 853 feet is 1.0 degrees880 – 890 Black and minor gray-red, massive, crystalline limestone with white and yellow-olive calcite veinlets; grade is as above; driller noted drilling fluid loss at 887 feet

890 – 950 Black with minor light red, weakly bedded, crystalline limestone with white calcite veinlets and rare euhedral, fine-grain, disseminated pyrite; grade is as above; driller noted fracture at 940 feet

950 – 980 As above but calcite is less abundant; deviation is 1.1 degrees at 973 feet

980 – 1030 Black, minor light red, weakly bedded, carbonaceous, limestone with white and moderate yellow calcite; grade is medium pebble to coarse sand; driller noted fractures at 989, 1000, 1007, and 1023 feet; deviation is 1.1 degrees at 1039 feet

1030 – 1040 As above with 10% black shale; gamma log indicates a clay-rich layer from 1030 to 1042 feet

1040 – 1090 Black, weakly bedded, carbonaceous limestone with white to light brown calcite veinlets; limestone is interbedded with soft, carbonaceous black shale containing rare disseminated, euhedral, fine-grain pyrite; grade is medium pebble to coarse sand; driller noted fractures at 1041, 1050 and 1054 feet; gamma log shows a clay-rich layer from 1043 to 1052 feet

1090 – 1094 As above with medium gray limestone and without black shale; calcite is less abundant

Total Depth – 1094 feet

NOTE: Samples were logged while wet. Colors were determined by comparison to the Geological Society of America rock color chart. Samples used in compiling this lithologic log came from sample piles and from chip trays.

WELL DRILLER'S REPORT
State of Utah
Division of Water Rights

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

RECEIVED
AUG 03 2005
WATER RIGHTS
SALT LAKE

Well Identification

Change Application: a29703 (55-1418)

WIN: ~~33808~~ 34524

Owner *Note any changes*

Corporation of the Presiding Bishop LDS Church
ATTN: Natural Resource Services
50 E. North Temple, 12th Floor East
Salt Lake City UT 84150-6321

Contact Person/Engineer: _____

Well Location *Note any changes*

N 2671 E 941 from the SW corner of section 01, Township 6S, Range 1W, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Drillers Activity Start Date: Feb 1, 2005 Completion Date: August 1, 2005

Check all that apply: [X] New [ ] Repair [ ] Deepen [ ] Clean [ ] Replace [ ] Public Nature of Use: _____

If a replacement well, provide location of new well. _____ feet north/south and _____ feet east/west of the existing well.

DEPTH (feet) FROM	TO	BOREHOLE DIAMETER (in)	DRILLING METHOD	DRILLING FLUID
~~0~~	~~123~~	~~16"~~	~~Cable tool~~	~~none used~~
~~123~~	~~425~~	~~12"~~	~~Cable tool~~	~~none used~~

Well Log

DEPTH (feet) FROM	TO	WATER	PERMEABLE High	PERMEABLE Low	UNCONSOLIDATED CLAY	SILT	SAND	GRAVEL	COBBLES	BOULDER	OTHER	CONSOLIDATED ROCK TYPE	COLOR	DESCRIPTION AND REMARKS (e.g., relative %, grain size, sorting, angularity, bedding, grain composition density, plasticity, shape, cementation, consistancy, water bearing, ordor, fracturing, minerology, texture,degree of weathering, hardness, water quality, etc.)
0	12				X	X	X						Brown	
12	32				X				X				Tan	hard clay w/angular cobbles
32	45								X	X			Tan	unconsolidated
45	90						X		X				Tan	
90	110	X		X						X	X		pink	brackish sulfery water
110	121				X					X	X		pink	unconsolidated
121	137	X	X									X Limestone	Gray	solid rock
137	285											X Limestone	Gray	Bedrock formation varying colors densities and fractures
285	425											X Shale	Black	

Static Water Level

Date 07-19-05 Water Level 75 feet Flowing? [ ] Yes [X] No

Method of Water Level Measurement E pizometer If Flowing, Capped Pressure n/a PSI

Point to Which Water Level Measurement was Referenced ground level Elevation _____

Height of Water Level reference point above ground surface 0 feet Temperature 68 degrees [ ] C [X] F

Construction Information

DEPTH (feet) FROM	TO	CASING TYPE AND MATERIAL/GRADE	WALL THICK (in)	NOMINAL DIAM. (in)
0	123	ASTM A 53B Steel	.375	12
+2	300	ASTM A53B Steel	.375	10

☐SCREEN ☐PERFORATIONS ☐OPEN BOTTOM

DEPTH (feet) FROM	TO	SCREEN SLOT SIZE OR PERF SIZE (in)	SCREEN DIAM. OR PERF LENGTH (in)	SCREEN TYPE OR NUMBER PERF (per round/interval)
125	135	.050	10"	SS 304
190	220	.050	10"	SS 304
240	280	.050	10"	SS 304

Well Head Configuration: temporary cap Access Port Provided? ☐Yes ☒No

Casing Joint Type: welded Perforator Used: none used

Was a Surface Seal Installed? ☒Yes ☐No Depth of Surface Seal: 120 feet Drive Shoe? ☒Yes ☐No

Surface Seal Material Placement Method: 16" conductor casing/gravity fill

DEPTH (feet) FROM	TO	SURFACE SEAL / INTERVAL SEAL / FILTER PACK / PACKER INFORMATION: SEAL MATERIAL, FILTER PACK and PACKER TYPE and DESCRIPTION	**Quantity** of Material Used (if applicable)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	300	6/12 silica sand	36,000 lbs	
0	100	¼" washed chips	28,000 lbs	
0	123'	Bentonite chips	132 # 50 bags	

Well Development and Well Yield Test Information

DATE	METHOD	YIELD	Units Check One GPM	Units Check One CFS	DRAWDOWN (ft)	TIME PUMPED (hrs & min)
06-17-05	pump test	300	X		0	30 hrs
06-25-05	pump test	900	X		0	24 hrs

Pump (Permanent)

Pump Description: none installed Horsepower: _____ Pump Intake Depth: _____ feet

Approximate Maximum Pumping Rate: _____ Well Disinfected upon Completion? ☐Yes ☐No

Comments

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

Well Driller Statement

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

Name JOHNSON DRILLING CO INC (Person, Firm, or Corporation - Print or Type) License No. 524

Signature Paul F Johnson (Licensed Well Driller) Date 08-01-05

ATTACHMENT C
STANDARD REQUIREMENTS AND REGULATORY CITATIONS
R309-515-6 (DDW)
R655-4 (DWRi)

ATTACHMENT C
STANDARD REQUIREMENTS AND REGULATORY CITATIONS

This section contains standard requirements and citations from UAC R309 and UAC R655, as provided by the staff of the DDW. The CONTRACTOR is required to adhere to these State of Utah requirements and citations. Sentences in "*italics*" indicate if the citation is not applicable to the project.

CONTRACTOR shall comply with the following requirements if applicable:

R309-515-6 (5) Outline of Well Approval Process.

Well PER, Plans, and Specifications Approval

(a) Well drilling shall not commence until both of the following items are submitted and receive a favorable review:

(i) a Preliminary Evaluation Report on source protection issues as required by R309-600-13, and

(ii) engineering plans and specifications governing the well drilling, prepared by a licensed well driller holding a current Utah Well Drillers License or prepared, signed, and stamped by a licensed professional engineer or professional geologist licensed to practice in Utah.;

(b) Inspection of Well Sealing During Construction.

(i) Authorized Individuals

(A) The following individuals are authorized to witness the well sealing procedure for a public drinking water well:

(I) an engineer or a geologist from the Division of Drinking Water;

(II) a district engineer of the Department of Environmental Quality;

(III) an authorized representative of the Division of Water Rights; or,

(IV) an individual having written authorization from the Director and meeting the below listed criteria.

(B) At the time of the well sealing an individual, who is authorized per (i)(A)(IV), shall present to the well driller a copy of the letter authorizing him or her to witness a well sealing on behalf of the Division of Drinking Water. A copy of this letter shall be appended to the witness certification letter.

(C) At least three days before the anticipated well sealing, the well driller shall arrange for an authorized witness listed in (i)(A) above to witness the procedure. (See R309-515-6(6)(i)).

(ii) Obtaining Authorization

(A) To be authorized per (i)(A)(IV) above to witness a well sealing procedure, an individual must have no relationship to the driller or the well's owner. The individual must have at least five years professional experience designing wells, supervising well drilling or other equivalent experience associated with well drilling or well sealing that is acceptable to the Director.

(B) Individuals, desiring the Director's authorization to witness a well sealing procedure, shall provide the following information to the Director for review over his or her signature attesting to the correctness of the information:

(I) a detailed description of the applicant's experience with well drilling projects, including number of years of experience and type of work. Three references confirming this professional experience are required.

(II) evidence of licensure as a professional engineer or professional geologist in Utah.

(III) no relationship may exist between a person authorized to witness well sealings and a well driller that would serve as the basis for suspicion of favoritism, leniency, or punitive action in the performance of this task. Examples of such relationships would be family; former long-term employment associations; business partnerships, either formal or informal; etc. The Director's decision, with right of appeal as provided in R305-7, shall be accepted relative to what constitutes a conflict of interest or a relationship sufficient to disqualify an applicant from all or specific witness opportunities.
(IV) An acknowledgement that he/she would not be acting as an agent or employee of the State of Utah and any losses incurred while acting as a witness would not be covered by governmental immunity or Utah's insurance.
(VI) Willingness to follow established protocols and attend such training events as may be required by the Director.
(VII) Complete with a minimum 75 percent passing grade, an examination on water well drilling rules, as offered by the Division of Water Rights.

(C) The Director may rescind the authorization if an individual fails to comply with the criteria or conditions of authorization listed above.

Guidance: A conflict of interest occurs whenever a duty, such as acting in the interest of the public, intersects with a personal desire (either positive or negative), such as monetary gain or a personal relationship, requiring a decision to be made between them. Each individual faced with a conflict between acting in the public's interest or acting for personal benefit is expected to act in the public's interest as it relates to sealing a well. Questions relating to possible conflicts may be referred to the Director.

(iii) Well Seal Certification

The individual witnessing the well sealing procedure shall provide a signed letter, including the following information, to the Director within 30 days of the well sealing:

(A) certification that the well sealing procedure met all the requirements of Rule R309-515-6(6)(i);
(B) the water right under which the well was drilled and the well driller's license number;
(C) the public water system name (if applicable);
(D) the latitude and longitude of the well and method used for its determination;
(E) the well head's approximate elevation;
(F) casing diameter(s), length(s), and material(s);
(G) the size of the annulus between the borehole and casing;
(H) a description of the sealing process including the sealing material used, its volume, density, method of placement, and depth from surface; and,
(I) the names and company affiliations of other individuals observing the sealing procedure including, but not limited to, the well driller, the well owner, and/or a consultant.

(c) After completion of the well drilling, the following information shall be submitted and receive a favorable review before water from the well can be introduced into a public water system:

(i) a copy of the "Report of Well Driller" as required by the State Engineer's Office which is complete in all aspects and has been stamped as received by the same;

(ii) a copy of the letter from the authorized individual described in R309-515-6(5)(b) above, indicating inspection and confirmation that the well was grouted in accordance with the well drilling specifications and the requirements of this rule;
(iii) a copy of the aquifer drawdown test data, as a minimum, including the yield versus drawdown test data, as described in R309-515-6(10)(b) along with comments and interpretation by a licensed professional engineer or licensed professional geologist of the graphic drawdown information required by R309-515-6(10)(b)(vi)(E);
(iv) a copy of the chemical analyses required by R309-515-4(5);
(v) acceptable evidence that the water system owner has a legal right to divert water for the proposed use(s) from the well source(s);
(vi) a copy of complete plans and specifications prepared, signed, and stamped by a licensed professional engineer covering the well housing, equipment, and diversion piping necessary to introduce water from the well into the distribution system; and
(vii) a bacteriological analysis of water obtained from the well after installation of permanent equipment, disinfection, and flushing.

(d) An Operation Permit shall be obtained in accordance with R309-500-9 before any water from the well is introduced into a public water system.

R309-515-6 (6) Well Materials, Design and Construction

Well Interior Surfaces

(a) ANSI/NSF Standards 60 and 61 Certification.
All interior surfaces must consist of products complying with ANSI/NSF Standard 61. This requirement applies to drop pipes, well screens, coatings, adhesives, solders, fluxes, pumps, switches, electrical wire, sensors, and all other equipment or surfaces which may contact the drinking water.
All substances introduced into the well during construction or development shall be certified to comply with ANSI/NSF Standard 60. This requirement applies to drilling fluids (biocides, clay thinners, defoamers, foamers, loss circulation materials, lubricants, oxygen scavengers, viscosifiers, weighting agents) and regenerants.

(b) Permanent Steel Casing Pipe shall:
(i) be new single steel casing pipe meeting AWWA Standard A-100, ASTM or API specifications and having a minimum weight and thickness as given in Table 6 found in R655-4-11.2.3 of the Utah Administrative Code (Administrative Rules for Water Well Drillers, adopted April 11, 2011, Division of Water Rights);
(ii) have additional thickness and weight, if minimum thickness is not considered sufficient to assure reasonable life expectancy of the well;
(iii) be capable of withstanding forces to which it is subjected;
(iv) be equipped with a drive shoe when driven;
(v) have full circumferential welds or threaded coupling joints; and
(vi) project at least 18 inches above the anticipated final ground surface and at least 12 inches above the anticipated pump house floor level. At sites subject to flooding, the top of the well casing shall terminate at least three feet above the 100-year flood level or the highest known flood elevation, whichever is higher.

(c) Non-Ferrous Casing Material.
The use of any non-ferrous material for a well casing shall receive prior approval of the Director based on the ability of the material to perform its desired function.
Thermoplastic water well casing pipe shall meet AWWA Standard A100-06 and shall bear the logo NSF-wc indicating compliance with NSF Standard 14 for use as well casing.

Guidance: Approval for non-ferrous well casing will be determined considering well depth, formations, temperatures, corrosion potential, well seal material, and other pertinent information.

(d) Disposal of Cuttings.
Cuttings and waste from well drilling operations shall not be discharged into a waterway, lake, or reservoir. The rules of the Utah Division of Water Quality must be observed with respect to these discharges.

(e) Packers.
Packers, if used, shall be of material that will not impart taste, odor, toxic substances, or bacterial contamination to the well water. Lead or partial lead packers are specifically prohibited.

(f) Screens.
The use of well screens is recommended where appropriate and, if used, they shall:
(i) be constructed of material resistant to damage by chemical action of groundwater or cleaning operations;
(ii) have size of openings based on sieve analysis of formations or gravel pack materials;
(iii) have sufficient diameter to provide adequate specific capacity and low aperture entrance velocities;
Guidance: Usually the entrance velocities should not exceed 0.1 fps.
(iv) be installed so that the operating water level remains above the screen under all pumping conditions; and,
(v) be provided with a bottom plate or wash-down bottom fitting of the same material as the screen.

(g) Plumbness and Alignment Requirements.
Every well shall be tested for plumbness and vertical alignment in accordance with AWWA Standard A100. Plans and specifications submitted for review shall:
(i) have the test method and allowable tolerances clearly stated in the specifications; and,
(ii) clearly indicate any options the design engineer may have if the well fails to meet the requirements. Generally, wells may be accepted if the misalignment does not interfere with the installation or operation of the pump or uniform placement of grout.

(h) Casing Perforations.
The placement of perforations in the well casing shall:
(i) be located, as far as practical, to permit the uniform collection of water around the circumference of the well casing; and,
(ii) be of dimensions and size to restrain the water bearing soils from entrance into the well.

(i) Well Sealing Techniques and Requirements.
For all public drinking water wells, the annulus between the outermost well casing and the borehole wall shall be sealed with grout to a depth of at least 100 feet below the ground surface unless an "exception" is issued by the Director (see R309-500-4(1)). If more than one casing is used, including a conductor casing, the annulus between the outermost casing and the next inner casing shall be sealed with grout (meeting the sealing materials requirements of R309-515-6(i)(ii) herein) or with a water tight steel ring having a thickness equal to that of the permanent well casing and continuously welded to both casings. If a public drinking water well will be equipped with a pitless adapter or unit, a well seal shall be installed to a minimum depth of 110 feet to take into account the top 10 feet of compromised seal interval.
Guidance: This is required in order to prevent the seepage of undesirable surface or shallow ground water along the casing into the water bearing aquifer. The Division

of Water Rights Administrative Rules for Water Wells Rule R655-4-11.7.5, Pitless Adapters/Units states, "A cement grout seal shall not be allowed within the pitless unit or pitless adapter sealing interval. The pitless adapter or unit sealing interval shall be sealed with unhydrated bentonite. The pitless adapter or unit, including the cap or cover, pitless case and other attachments, shall be designed and constructed to be watertight to prevent the entrance of contaminants into the well from surface or near-surface sources." Therefore, a cement seal should not be used in the future pitless interval as a cement seal would need to be chipped and broken away from the casing when the pitless area is excavated and installed which could lead to casing damage. A bentonite seal must be used in the future pitless interval.

The following shall apply to all drinking water wells:

(i) Consideration During Well Construction.

(A) Sufficient annular opening shall be provided to permit a minimum of two inches of grout between the outermost permanent casing and the drilled hole, taking into consideration any joint couplings.

(B) The casing(s) must be placed to permit unobstructed flow and uniform thickness of grout.

Guidance: For the purpose of determining the dimension of the annular opening between the drilled hole and or any carrier casing or permanent casing which may be used, the nominal pipe dimension of casing or hole can be used. Centralizers, casing spacers, or welded guides are recommended to center the casing and to provide uniform grout thickness.

(ii) Sealing Materials.

(A) Neat Cement Grout.

Cement, conforming to ASTM Standard C150, and water, with no more than six gallons of water per sack of cement, shall be used for two-inch openings. Additives may be used to increase fluidity subject to approval by the Director.

(B) Concrete Grout.

Equal parts of cement conforming to ASTM Standard C150, and sand, with not more than six gallons of water per sack of cement, may be used for openings larger than two inches.

(C) Clay Seal.

Where an annular opening greater than six inches is available, a seal of swelling bentonite meeting the requirements of R655-4-11.4.2 may be used when approved by the Director.

(iii) Application.

(A) When the annular opening is less than four inches, grout shall be installed under pressure, by means of a positive displacement grout pump, from the bottom of the annular opening to be filled.

(B) When the annular opening is four or more inches and 100 feet or less in depth, and concrete grout is used, it may be placed by gravity through a grout pipe installed to the bottom of the annular opening in one continuous operation until the annular opening is filled.

(C) All temporary construction casings shall be removed prior to or during the well sealing operation. Any exceptions shall be approved by the State Engineer's Office, and evidence of State Engineer's Office's approval shall be submitted to the Director (see R655-4-11.4.3.1 for conditions concerning leaving temporary surface casing in place). A temporary construction casing is a casing not intended to be part of the permanent well.

(D) When a "well in a protected aquifer" classification is desired, the grout seal shall extend from the ground surface down to at least 100 feet below the surface, and through the protective clay layer (see R309-600-6(1)(x)).

(E) After cement grouting is applied, work on the well shall be discontinued until the cement or concrete grout has properly set, usually a period of 72 hours.

Guidance: "Public Water Supply Well Grouting Requirements and Procedures" is available on the Division's website as additional information for grout placement.

(j) Water Entered Into Well During Construction.

Any water entering a well during construction shall not be contaminated and should be obtained from a chlorinated municipal system. Where this is not possible, the water must be treated to produce a 100 mg/l free chlorine residual in accordance with R655-4-11.6.5.

(k) Gravel Pack Wells.

The following shall apply to gravel packed wells:

(i) the gravel pack material shall be of well-rounded particles, at least 90 percent siliceous material, no more than five percent acid solubility, smooth and uniform, free of foreign material, properly sized, washed, and then disinfected immediately prior to or during placement;

(ii) the gravel pack shall be placed in one uniform continuous operation;

(iii) refill pipes, when used, shall be Schedule 40 steel pipe incorporated within the pump foundation and terminated with screwed or welded caps at least 12 inches above the pump house floor or concrete apron;

(iv) refill pipes located in the grouted annular opening shall be surrounded by a minimum of 1.5 inches of grout;

(v) protection shall be provided to prevent leakage of grout into the gravel pack or screen; and,

(vi) any casings not withdrawn entirely shall meet requirements of R309-515-6(6)(b) or R309-515-6(6)(c).

R309-515-6 (7) Well Development

Well Development

(a) Every well shall be developed to remove the native silts and clays, drilling mud or finer fraction of the gravel pack.

(b) Development should continue until the maximum specific capacity is obtained from the completed well.

(c) Where chemical conditioning is required, the specifications shall include provisions for the method, equipment, chemicals, testing for residual chemicals, and disposal of waste and inhibitors.

(d) Where blasting procedures may be used the specifications shall include the provisions for blasting and cleaning. Special attention shall be given to assure that the grouting and casing are not damaged by the blasting.

R309-515-6 (8) Well Capping

Capping Requirements.

(a) The well shall be securely capped in accordance with R655-4-14.1 until permanent equipment can be installed.

(b) At all times during the progress of work the contractor shall provide protection to prevent tampering with the well or entrance of foreign materials.

Guidance: A welded metal plate or a threaded cap is the preferred method for capping a completed well until permanent equipment is installed.

R309-515-6 (9) Well Abandonment

Well Abandonment.

(a) Test wells and groundwater sources which are to be permanently abandoned shall be abandoned in accordance with R655-4-14.

(b) Wells to be abandoned shall be sealed to prevent undesirable exchange of water from one aquifer to another. Preference shall be given to using a neat cement grout. Where fill materials are used, which are other than cement grout or concrete, they shall be disinfected and free of foreign materials. When an abandoned well is filled with cement-grout or concrete, these materials shall be applied to the well hole through a pipe, tremie, or bailer.

R309-515-6 (10) Well Assessment

Well Assessment.

(a) Step Drawdown Test.

Preliminary to the constant-rate test required below, it is recommended that a step-drawdown test (uniform increases in pumping rates over uniform time intervals with single drawdown measurements taken at the end of the intervals) be conducted to determine the maximum pumping rate for the desired intake setting.

(b) Constant-Rate Test.

A "constant-rate" yield and drawdown test shall:

(i) be performed on every production well after well development and prior to placement of the permanent pump,

(ii) have the test methods clearly indicated in the specifications,

(iii) have a test pump with sufficient capacity that when pumped against the maximum anticipated drawdown, it will be capable of pumping in excess of the desired design discharge rate,

(iv) provide for continuous pumping for at least 24 hours or until stabilized drawdown has continued for at least six hours when test pumped at a "constant-rate" equal to 1.5 times the desired design discharge rate,

(v) provide the following data:

(A) capacity vs. head characteristics for the test pump (manufacturer's pump curve),

(B) static water level (in feet to the nearest tenth, as measured from an identified datum; usually the top of casing),

(C) depth of test pump intake,

(D) time and date of starting and ending test(s),

Guidance: It is recommended to monitor any existing wells in the area during the pump test to perform a more useful aquifer test and determine if there will be interference from other wells.

(vi) For the "constant-rate" test provide the following at time intervals sufficient for at least ten essentially uniform intervals for each log cycle of the graphic evaluation required below:

(A) record the time since starting test (in minutes),

(B) record the actual pumping rate,

(C) record the pumping water level (in feet to the nearest tenth, as measured from the same datum used for the static water level),

(D) record the drawdown (pumping water level minus static water level in feet to the nearest tenth),

(E) provide graphic evaluation on semi logarithmic graph paper by plotting the drawdown measurements on the arithmetic scale at locations corresponding to time since starting test on the logarithmic scale, and

(vii) Immediately after termination of the constant-rate test, and for a period of time until there are no changes in depth to water level measurements for at least six hours, record the following at time intervals similar to those used during the constant-rate pump test:

(A) time since stopping pump test (in minutes),
depth to water level (in feet to the nearest tenth, as measured from the same datum used for the pumping water level).

(c) Safe Yield. If the aquifer drawdown test data show that the drawdown has stabilized, the Director will consider 2/3 of the pumping rate used in the constant-rate test as the safe yield of the well. The safe yield is used to determine the number of permanent residential connections or ERCs that a well source can support.

R309-515-6 (11) Well Disinfection

Well Disinfection.

Every new, modified, or reconditioned well including pumping equipment shall be disinfected before being placed into service for drinking water use. These shall be disinfected according to AWWA Standard C654-03 and A100-06 as modified to incorporate the following as a minimum standard:

(a) the well shall be disinfected with a chlorine solution of sufficient volume and strength and so applied that a concentration of at least 50 parts per million is obtained in all parts of the well and comes in contact with equipment installed in the well. This solution shall remain in the well for a period of at least eight hours, and

(b) a satisfactory bacteriologic water sample analysis shall be obtained prior to the use of water from the well in a public water system.

R309-515-6 (13) Well House Construction

The use of a well house is strongly recommended, particularly in installations utilizing above ground motors.

In addition to applicable provisions of R309-540, well pump houses shall conform to the following:

Well Casing Projection Above (Eventual) Floor

(a) Casing Projection Above Floor.

The permanent casing for all ground water wells shall project at least 12 inches above the pump house floor or concrete apron surface and at least 18 inches above the final ground surface. However, casings terminated in underground vaults may be permitted if the vault is provided with a drain to daylight sized to handle in excess of the well flow and surface runoff is directed away from the vault access.

Well Casing Termination at Flood Sites

(d) Well Casing Termination at Flood Sites.

The top of the well casing at sites subject to flooding shall terminate at least 3 feet above the 100 year flood level or the highest known flood elevation, whichever is higher (refer to R309-515-6(6)(b)(vi)).

R309-600-6 Protected Aquifer Status

(x) "Protected aquifer" means a producing aquifer in which the following conditions are met:

(i) A naturally protective layer of clay, at least 30 feet in thickness, is present above the aquifer;

(ii) the PWS provides data to indicate the lateral continuity of the clay layer to the extent of zone two; and

(iii) the public-supply well is grouted with a grout seal that extends from the ground surface down to at least 100 feet below the surface, and for a thickness of at least 30 feet through the protective clay layer.

R309-600-6 Replacement Well

"Replacement well" means a public-supply well drilled for the sole purpose of replacing an existing public-supply well which is impaired or made useless by structural difficulties and in which the following conditions are met:

(i) the proposed well location shall be within a radius of 150 feet from an existing ground-water supply well, as defined in R309-600-6(1)(k); and

(ii) the PWS provides a copy of the replacement application approved by the State Engineer (refer to Section 73-3-28 of the Utah Code Annotated).

R655-4-4.1 Authorization to Drill

Authorization to Drill Well

The OWNER shall provide the driller with a start card.

4.1 Authorization to Drill

The well driller shall make certain that a valid authorization or approval to drill exists before engaging in regulated well drilling activity. Authorization to drill shall consist of a valid 'start card' based on any of the approvals listed below. Items 4.1.1 through 4.1.12 allow the applicant to contract with a well driller to drill, construct, deepen, replace, repair, renovate, or abandon exactly one well at each location listed on the start card or approval form. The drilling of multiple borings/wells at an approved location/point of diversion is not allowed without authorization from the state engineer's office. Most start cards list the date when the authorization to drill expires. If the expiration date has passed, the start card and authorization to engage in regulated drilling activity is no longer valid. If there is no expiration date on the start card, the driller must contact the state engineer's office to determine if the authorization to drill is still valid. When the work is completed, the permission to drill is terminated. Preauthorization or pre-approval of pump installation/repair work, well cleaning, development, testing, and disinfection is not required. A well renovation permit is required if an existing well is to be modified by activities such as deepening, casing/seal/gravel pack repair/renovation, liner installation, pitless adapter/unit installation, and perforating/screen installation. A well renovation permit is not required if the well is not modified by activities such as cleaning, development, testing, disinfection, and pump work.

4.1.1 An approved application to appropriate.

4.1.2 A provisional well approval letter (also known as a Rush Letter Approval).
An approved provisional well letter grants authority to drill but allows only enough water to be diverted to determine the characteristics of an aquifer or the existence of a useable groundwater source.

4.1.3 An approved permanent change application.

4.1.4 An approved exchange application.

4.1.5 An approved temporary change application.

4.1.6 An approved application to renovate or deepen an existing well.

4.1.7 An approved application to replace an existing well.

4.1.8 An approved monitor well letter.
An approved monitor well letter grants authority to drill but allows only enough water to be diverted to monitor groundwater.
4.1.9 An approved heat exchange well letter.
4.1.10 An approved cathodic protection well letter.
4.1.11 An approved non-production well construction application.
4.1.12 Any letter or document from the state engineer directing or authorizing a well to be drilled or work to be done on a well.

R655-4-4.2 Well Start Card

The OWNER shall provide the driller with a start card.

4.2 Start Cards

4.2.1 Prior to commencing work to drill, construct, deepen, replace, repair, renovate, clean, or develop any well governed by these administrative rules, the driller must notify the state engineer of that intention by transmitting the information on the "Start Card" to the state engineer by telephone (leaving a voice mail is acceptable notification), by facsimile (FAX), by hand delivery, or by e-mail (with completed Start Card scanned and attached to e-mail). Thereafter, a completed original Start Card must be sent to the state engineer by the driller after it has been telephoned in (including voice mail). A completed original Start Card does not need to be sent to the state engineer by the driller after it has been faxed or E-mailed. A copy of the Start Card should be kept at the drill site at all times regulated activity is being conducted.

4.2.2 A specific Start Card is printed for each well drilling approval and is furnished by the state engineer to the applicant or the well owner. The start card is preprinted with the water right or non-production well number, owner name/address, and the approved location of the well. The state engineer marks the approved well drilling activity on the card. If a Start Card is stamped with 'Special Conditions', the licensee shall contact the state engineer's office to determine what the special drilling conditions or limitations are; then implement them in the drilling and construction of the well. The driller must put the following information on the card:

a. The date on which work on the well will commence;
b. The projected completion date of the work;
c. The well driller's license number;
d. The licensed well driller's signature.

4.2.3 When a single authorization is given to drill wells at more than one point of diversion, a start card shall be submitted for each location to be drilled.

4.2.4 Following the submittal of a start card, if the actual start date of the drilling activity is postponed beyond the date identified on the start card, the licensed driller must notify the state engineer of the new start date.

4.2.5 A start card is not required to abandon a well. However, prior to commencing well abandonment work, the driller is required to notify the state engineer by telephone, by facsimile, or by e-mail of the proposed abandonment work. The notice must include the location of the well. The notice should also include the water right or non-production well number associated with the well and the well owner if that information is available.

4.2.6 A start card or pre-notification is not required to perform pump installation and repair work on a well.

R655-4-4.3 Well Driller Requirements

Well Driller Requirements

4.3 General Requirements During Construction

4.3.1 The well driller or pump installer shall have the required penal bond continually in effect during the term of the license; otherwise the license will become inactive.
4.3.2 The well driller's/pump installer's license number or company name exactly as shown on the license must be prominently displayed on each well drilling/pump rig operated under the license. If the company name is changed the licensee must immediately inform the state engineer of the change in writing.
4.3.3 A licensed well driller or a registered drill rig operator must be at the well site whenever the following aspects of well construction are in process: advancing the borehole, setting casing and screen, placing a filter pack, constructing a surface seal, or similar activities involved in well deepening, renovation, repair, cleaning, developing, testing, disinfecting, capping, pitless installation, or abandoning. All registered drill rig operators working under a well driller's license must be employees of the well driller and must use equipment either owned by or leased by the licensed well driller.
4.3.3.1 A licensed pump installer or a registered pump rig operator must be at the well site whenever the following aspects of pump work are in process: pump removal, pump installation, modification to the well head including capping, sealing, and pitless adapter/unit installation, or similar activities on and within the well involving pump installation/repair. Inasmuch as a licensed pump installer is allowed to clean, develop, test, and disinfect a regulated well, these activities must be performed in the presence of a licensed pump installer or registered pump rig operator. All registered pump rig operators working under a pump installer's license must be employees of the pump installer and must use equipment either owned by or leased by the licensed pump installer.
4.3.3.2 A registered drill rig operator who is left in responsible charge of advancing the borehole, setting casing and screen, placing a filter pack, constructing a surface seal, or similar activities involved in well deepening, renovation, repair, cleaning, developing, testing, disinfecting, capping, pitless installation, or abandoning must have a working knowledge of the minimum construction standards and the proper operation of the drilling rig. The licensed well driller is responsible to ensure that a registered operator is adequately trained to meet these requirements.
4.3.3.3 A registered pump rig operator who is left in responsible charge of pump installation or repair must have a working knowledge of the minimum construction standards and the proper operation of the pump rig. The licensed well driller or pump installer is responsible to ensure that a registered operator is adequately trained to meet these requirements.
4.3.4 State engineer provisions for issuing cease and desist orders (Red Tags)
4.3.4.1 Construction Standards: The state engineer or staff of the Division of Water Rights may order that regulated work on a well cease if a field inspection reveals that the construction does not meet the minimum construction standards to the extent that the public interest might be adversely affected.
4.3.4.2 Licensed Drilling Method: A cease work order may also be issued if the well driller is not licensed for the drilling method being used for the well construction.
4.3.4.3 Incompetent Registered Operator: If, during a field inspection by the staff of the Division of Water Rights, it is determined that a registered operator in responsible charge does not meet these requirements, a state engineer's red tag (see Section 4.3.4) shall be placed on the drilling rig or pump rig and the drilling/pump operation shall be ordered to shut down. The order to cease work shall remain effective until a qualified person is available to perform the work.
4.3.4.4 No licensee or registered operator on site: If, during a field inspection by the staff of the Division of Water Rights, it is determined that neither a licensee or registered operator are one

site when regulated well activity is occurring, the state engineer may order regulated well work to cease.
4.3.4.5 General: The state engineer's order shall be in the form of a red tag which shall be attached to the drilling/pump rig. A letter from the state engineer shall be sent to the licensee to explain the sections of the administrative rules which were violated. The letter shall also explain the requirements that must be met before the order can be lifted.
4.3.4.6 A licensee may appeal a Cease and Desist order by:
4.3.4.6.1 submitting to the Division a written statement clearly and concisely stating the specific disputed facts, the supporting facts, and the relief sought; or
4.3.4.6.2 requesting a hearing on the issue according to the provisions of R655-4-7.
4.3.4.7 A Cease and Desist Order shall remain in force during the pendency of the appeal.
4.3.5 When required by the state engineer, the well driller or registered operator shall take lithologic samples at the specified intervals and submit them in the bags provided by the state engineer.
4.3.6 A copy of the current Administrative Rules for Water Wells should be available at each well construction site for review by the construction personnel. Licensed well drillers/pump installers and registered operators must have proof of licensure or registration with them on site during regulated well activity.
4.3.7 Prior to starting construction of a new well, the licensed driller shall investigate and become familiar with the drilling conditions, geology of potential aquifers and overlying materials, anticipated water quality problems, and know contaminated water bearing zones that may be encountered in the area of the proposed drilling activity.

R655-4-4.4 Removing Drill Rig from Well Site.

4.4 Removing Drill Rig From Well Site.
4.4.1 A well driller shall not remove his drill rig from a well site unless the well drilling activity is properly completed or abandoned in accordance with the construction standards in Sections 9 thru 12.
4.4.2 For the purposes of these rules, the regulated work on a well will be considered completed when the well driller removes his drilling rig from the well site. The regulated pump work on a well will be considered completed when the pump installer removes his pump rig from the well site.
4.4.3 The well driller may request a variance from the state engineer to remove a drill rig from a well prior to completion or abandonment. This request must be in written form to the state engineer. The written request must provide justification for leaving the well incomplete or un-abandoned and indicate how the well will be temporarily abandoned as provided in Section R655-4-14 and must give the date when the well driller plans to continue work to either complete the well or permanently abandon it.

R655-4-4. Official Well Driller's Report (Well Logs)

4.5 Official Well Driller's Report (Well Log)
4.5.1 Within 30 days of the completion of regulated work on any well, the driller shall file an official well driller's report (well log) with the state engineer. The blank well log form will be mailed to the licensed well driller upon receipt of the information on the Start Card as described in Subsection 4.2.
4.5.2 The water right number or non-production well number, owner name/address, and the approved location of the well will be preprinted on the blank well log provided to the well driller. The driller is required to verify this information and make any necessary changes on the well log prior to submittal. The state engineer will mark the approved activity (e.g., new,

replace, repair, deepen) on the well log. The driller must provide the following information on the well log:

a. The start and completion date of work on the well;
b. The nature of use for the well (e.g., domestic, irrigation, stock watering, commercial, municipal, provisional, monitor, cathodic protection, heat pump, etc.;
c. The borehole diameter, depth interval, drilling method and drilling fluids utilized to drill the well;
d. The lithologic log of the well based on strata samples taken from the borehole as drilling progresses;
e. Static water level information to include date of measurement, static level, measurement method, reference point, artesian flow and pressure, and water temperature;
f. The size, type, description, joint type, and depth intervals of casing, screen, and perforations;
g. A description of the filter pack, surface and interval seal material, and packers used in the well along with necessary related information such as the depth interval, quantity, and mix ratio;
h. A description of the finished wellhead configuration;
i. The date and method of well development;
j. The date, method, yield, drawdown, and elapsed time of a well yield test;
k. A description of pumping equipment (if available);
l. Other comments pertinent to the well activity completed;
m. The well driller's statement to include the driller name, license number, signature, and date.

4.5.3 Accuracy and completeness of the submitted well log are required. Of particular importance is the lithologic section which should accurately reflect the geologic strata penetrated during the drilling process. Sample identification must be logged in the field as the borehole advances and the information transferred to the well log form for submission to the state engineer.

4.5.4 An amended well log shall be submitted by the licensed driller if it becomes known that the original report contained inaccurate or incorrect information, or if the original report requires supplemental data or information. Any amended well log must be accompanied by a written statement, signed and dated by the licensed well driller, attesting to the circumstances and the reasons for submitting the amended well log.

R655-4-4.6 Official Well Abandonment Reports (Abandonment Logs)

4.6 Official Well Abandonment Reports (Abandonment Logs)

4.6.1 Whenever a well driller is contracted to replace an existing well under state engineer's approval, it shall be the responsibility of the well driller to inform the well owner that it is required by law to permanently abandon the old well in accordance with the provisions of Section R655-4-14.

4.6.2 Within 30 days of the completion of abandonment work on any well, the driller shall file an abandonment log with the state engineer. The blank abandonment log will be mailed to the licensed well driller upon notice to the state engineer of commencement of abandonment work as described in Subsection R655-4-4(4.2.5).

4.6.3 The water right number or non-production well number, owner name/address, and the well location (if available) will be preprinted on the blank abandonment log provided to the well driller. The driller is required to verify this information and make any necessary changes

on the abandonment log prior to submitting the log. The driller must provide the following information on the abandonment log:

a. Existing well construction information;
b. Date of abandonment;
c. Reason for abandonment;
d. A description of the abandonment method;
e. A description of the abandonment materials including depth intervals, material type, quantity, and mix ratio;
f. Replacement well information (if applicable);
g. The well driller's statement to include the driller name, license number, signature, and date.

4.6.4 When a well is replaced and the well owner will not allow the driller to abandon the existing well, the driller must briefly explain the situation on the abandonment form and submit the form to the state engineer within 30 days of completion of the replacement well.

R655-4-4.7 Official Pump Installation Report (Pump Logs)

4.7 Official Pump Installation Report (Pump Log).

4.7.1 Soon after the completion of regulated pump work on any well, the licensee shall file an official pump installation report (pump log) with the state engineer. If well disinfection is the only activity on a well, a pump log need not be filed with the state engineer. Blank pump log forms will be available to the licensee at any Division office, requested by mail, or downloaded from the Division's website (www.waterrights.utah.gov).

4.7.2 Pertinent information to be included on the pump log by the licensee shall consist of:

a. The water right number or non-production well number;
b. the well owner name and address;
c. The approved point of diversion or location of the well;
d. The start and completion date of work on the well;
e. The nature of use for the well (e.g., domestic, irrigation, stock watering, commercial, municipal, provisional, monitor, cathodic protection, heat pump, etc.;
f. Pertinent well details including casing diameters/depths, total well depth, well intake depth intervals, wellhead configuration including pitless adapter/unit configuration if applicable;
g. A detailed description of pump-related work performed on or in the well including pump setting depth, pump type, pumping rate, valving, drop piping, jointing, capping, testing, sealing, disinfection, and pitless adapter/unit installation;
h. Static water level information to include date of measurement, static level, measurement method, reference point, artesian flow and pressure, and water temperature;
i. A description of the finished wellhead configuration;
j. The date, method, yield, drawdown, and elapsed time of a well yield test;
k. Other comments pertinent to the well activity completed;
m. The pump installer's statement to include the licensee name, license number, signature, and date.

R655-4-4.8 Incomplete or Incorrectly Completed Report

4.8 Incomplete or Incorrectly Completed Reports

An incomplete log or a log that has not been completed correctly will be returned to the licensed well driller to be completed or corrected. The well log will not be considered filed with the state engineer until it is complete and correct.

4.8 Extensions of Time

The well driller may request an extension of time for filing the well log if there are circumstances which prevent the driller from obtaining the necessary information before the expiration of the 30 days. The extension request must be submitted in writing before the end of the 30-day period.

R655-4-4.9 Late Well Logs – Lapsed License

4.9 Late Well Logs – Lapsed License

All outstanding well logs or abandonment logs shall be properly submitted to the state engineer prior to the lapsing of a license. A person with a lapsed license who has failed to submit all well/abandonment logs within 90 days of lapsing will be subject to the state engineer's enforcement powers under Section 73-2-25 of the Utah Code (Related rules: Section R655-14 UAC)

R655-4-10 General Requirements

10.1 Standards

10.1.1 In some locations, the compliance with the following minimum standards will not result in a well being free from pollution or from being a source of subsurface leakage, waste, or contamination of the groundwater resource. Since it is impractical to attempt to prepare standards for every conceivable situation, the well driller or pump installer shall judge when to construct or otherwise perform work on wells under more stringent standards when such precautions are necessary to protect the groundwater supply and those using the well in question. Other state and local regulations pertaining to well drilling and construction, groundwater protection, isolation distances (setbacks) from potential contamination sources and/or other structures/boundaries, and water quality/testing regulations may exist that are either more stringent than these rules or that specifically apply to a given situation. It is the licensee's responsibility to understand and apply other federal, state, and local regulations as applicable.

R655-4-10.2 Well Site Locations

10.2 Well Site Locations.

10.2.1 Well site locations are described by course and distance from outside section corners or quarter corners (based on a Section/Township/Range Cadastral System) and by the Universal Transverse Mercator (UTM) coordinate system (NAD83 Map Datum) on all state engineer authorizations to drill (Start Cards). However, the licensee should also be familiar with local zoning ordinances, or county boards of health requirements which may limit or restrict the actual well location and construction in relationship to property/structure boundaries and existing or proposed concentrated sources of pollution or contamination such as septic tanks, drain fields, sewer lines, stock corrals, feed lots, etc. The licensee should also be familiar with the Utah Underground Facilities Act (Title 54, Chapter 8a of the Utah Code Annotated 1953 as amended) which requires subsurface excavators (including well drilling) to notify operators of underground utilities prior to any subsurface excavation. Information on this requirement can be found by calling Blue Stakes Utility Notification Center at (800)662-4111.

10.2.2 Regulated wells shall be drilled at the approved location as defined on the valid start card. The driller shall check the drilling location to see if it matches the state-approved location listed on the Driller's Start Card.

R655-4-10.3 Unusual Conditions

10.3.1 If unusual conditions occur at a well site and compliance with these rules and standards will not result in a satisfactory well or protection to the groundwater supply, a licensed water well driller or pump installer shall request that special standards be prescribed for a particular well (variance request). The request for special standards shall be in writing and shall set forth the location of the well, the name of the owner, the unusual conditions existing at the well site, the reasons and justification that compliance with the rules and minimum standards will not result in a satisfactory well, and the proposed standards that the licensee believes will be more adequate for this particular well. If the state engineer finds that the proposed changes are in the best interest of the public, the state engineer will approve the proposed changes by assigning special standards for the particular well under consideration. At the Division's discretion, the licensee applying for the variance may be required to provide additional technical information justifying the variance. The variance request will be evaluated, and a response will be given within fourteen days. In a public health emergency or other exceptional circumstance, verbal notification for a variance may be given. An emergency usually consists of a well failure resulting in a dry well or an unusable well. Driller convenience does not constitute an emergency.

R655-4-11 Well Drilling and Construction Requirements

11.0 General

11.0.1 Figures 1 through 5 are used to illustrate typical well construction standards, and can be viewed in the State of Utah Water Well Handbook available at the Division of Water Rights, 1594 West North Temple, Salt Lake City, Utah. Figure 1 illustrates the typical construction of a drilled well with driven casing such as a well drilled using the cable tool method or air rotary with a drill-through casing driver. Figure 2 illustrates the typical construction of a well drilled with an oversized borehole and/or gravel packed without the use of surface casing. Figure 3 illustrates the typical construction of a well drilled with an oversized borehole and/or gravel packed with the use of surface casing. Figure 4 illustrates the typical construction of a well drilled with an oversized borehole and/or gravel packed completed in stratified formations in which poor formation material or poor quality water is encountered. Figure 5 illustrates the typical construction of a well completed with PVC or nonmetallic casing.

R655-4-11.1 Approved Products, Materials, and Procedures

11.1.1 Any product, material or procedure designed for use in the drilling, construction, cleaning, renovation, development pump installation/repair, or abandonment of water production or non-production wells, which has received certification and approval for its intended use by the National Sanitation Foundation (NSF) under ANSI/NSF Standard 60 or 61, the American Society for Testing Materials (ASTM), the American Water Works Association (AWWA) or the American National Standards Institute (ANSI) may be utilized. Other products, materials or procedures may also be utilized for their intended purpose upon manufacturers certification that they meet or exceed the standards or certifications referred to in this section and upon state engineer approval.

R655-4-11.2 Well Casing - General

11.2 Well Casing - General

11.2.1 Drillers Responsibility. It shall be the sole responsibility of the well driller to determine the suitability of any type of well casing for the particular well being constructed, in accordance with these minimum requirements.

11.2.2 Casing Stick-up. The well casing shall extend a minimum of 18 inches above finished ground (land) level and the natural ground surface should slope away from the casing. A secure sanitary, weatherproof mechanically secured cap/seal or a completely welded cap shall be placed on the top of the well casing to prevent contamination of the well. If a vent is placed in the cap, it shall be properly screened to prevent access to the well by debris, insects, or other animals.

11.2.3 Steel Casing. All steel casing installed in Utah shall be in new or like-new condition, being free from pits or breaks, clean with all potentially dangerous chemicals or coatings removed, and shall meet the minimum specifications listed in Table 6 of these rules. In order to utilize steel well casing that does not fall within the categories specified in Table 6, the driller shall receive written approval from the state engineer. All steel casing installed in Utah shall meet or exceed the minimum ASTM, ANSI, or AWWA standards for steel pipe as described in Subsection 11.1 unless otherwise approved by the state engineer. Applicable standards (most recent revisions) may include:

ANSI/AWWA A100-AWWA Standard for Water Wells.

ANSI/ASTM A53-Standard Specifications for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

ANSI/ASTM A139-Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and over).

ANSI/AWWA C200-Standard for Steel Water Pipe-6 in. and Larger.

ASTM A589-89-Standard Specification for Seamless and Welded Carbon Steel Water-Well Pipe.

API Spec.5L and 5LS-Specification for Liner Pipe.

ASTM A106-Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service

ASTM A778-Standard Specifications for Welded, Unannealed Austenitic Stainless Steel Tubular Products.

ASTM A252-Standard Specification for Welded and Seamless Steel Pipe Piles.

ASTM A312-Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

ASTM A409- Standard Specification for Welded Large Diameter Austenitic Steel Pipe for Corrosive or High-Temperature Service

TABLE 6
MINIMUM WALL THICKNESS FOR STEEL WELL CASING

Depth								
Nominal Casing Diameter (in)	0 to 200 (ft)	200 to 300 (ft)	300 to 400 (ft)	400 to 500 (ft)	600 to 800 (ft)	800 to 1000 (ft)	1000 to 1500 (ft)	1500 to 2000 (ft)
2	.154	.154	.154	.154	.154	.154	...	...
3	.216	.216	.216	.216	.216	.216	...	...
4	.237	.237	.237	.237	.237	.237	.237	.237
5	.250	.250	.250	.250	.250	.250	.250	.250
6	.250	.250	.250	.250	.250	.250	.250	.250
8	.250	.250	.250	.250	.250	.250	.250	.250
10	.250	.250	.250	.250	.250	.250	.313	.313

12	.250	.250	.250	.250	.250	.250	.313	.313
14	.250	.250	.250	.250	.313	.313	.313	.313
16	.250	.250	.313	.313	.313	.313	.375	.375
18	.250	.313	.313	.313	.375	.375	.375	.438
20	.250	.313	.313	.313	.375	.375	.375	.438
22	.313	.313	.313	.375	.375	.375	.375	.438
24	.313	.313	.375	.375	.375	.438	...	...
30	.313	.375	.375	.438	.438	.500	...	...

Note: Minimum wall thickness in inches.

For nominal casing diameters less than five (5) inches, the minimum wall thickness must be equivalent to ASTM Schedule 40.

For any other casing diameter not addressed herein, prior approval by the state engineer is require.

0.250 = 1/4, 0.312 = 5/16, 0.375 = 3/8, 0.438 = 7/16.

R655-4-11.2.4 Plastic and Other Non-metallic Casing

11.2.4 Plastic and Other Non-metallic Casing.

11.2.4.1 Materials. PVC well casing and screen may be installed in Utah upon obtaining permission of the well owner. Other types of non-metallic casing or screen must be approved by the state engineer prior to installation. Plastic well casing and screen shall be manufactured and installed to conform with The American National Standards Institute (ANSI) or the American Society for Testing and Materials (ASTM) Standard F 480 (most recent version), which are incorporated by reference to these rules. Casing and screen meeting this standard is normally marked "WELL CASING" and with the ANSI/ASTM designation "F 480-, SDR-17 (or 13.5, 21, etc.)". All plastic casing and screen for use in potable water supplies shall be manufactured to be acceptable to the American National Standards Institute/National Sanitation Foundation (NSF) standard 61. Other types of plastic casings and screens may be installed upon manufacturers certification that such casing meets or exceeds the above described ASTM/SDR specification or ANSI/NSF approval and upon state engineer approval.

11.2.4.2 Minimum Wall Thickness and Depth Requirements. PVC well casing and screen with a nominal diameter equal to or less than four (4) inches and for non-production well purposes shall meet the minimum wall thickness required under ASTM Standard F480-95 SDR 21 or a Schedule 40 designation. PVC well casing and screen use for water production well purposes with a nominal diameter equal to or less than four (4) inches shall meet the minimum wall thickness required under ASTM Standard F480-95 SDR 17 or a Schedule 80 designation. PVC well casing and screen with a nominal diameter greater than four (4) inches shall meet the minimum wall thickness required under ASTM Standard F480 (most recent version) SDR 17 or a Schedule 80 designation. Additionally, caution should be used whenever other than factory slots or perforations are added to PVC well casing. The installation of hand cut slots or perforations significantly reduces the collapse strength tolerances of unaltered casings. The depth at which plastic casing and screen is placed in a well shall conform to the minimum requirements and restrictions as outlined in ASTM Standard F-480 (most recent version) and to PVC casing manufacturer recommendations. Liner pipe does not need to meet these wall thickness requirements if it is placed inside of a casing that does meet these wall thickness requirements.

11.2.4.3 Fiberglass Casing. Fiberglass reinforced plastic well casings and screens may be installed in wells upon obtaining permission of the well owner. All fiberglass casing or screens

installed in wells for use in potable water supplies shall be manufactured to be acceptable by ANSI/NSF Standard 61 and upon state engineer approval.

11.2.4.4 Driving Non-metallic Casing. Non-metallic casing shall not be driven, jacked, or dropped and may only be installed in an oversized borehole.

11.2.4.5 Protective Casing. If plastic or other non-metallic casing is utilized, the driller shall install a protective steel casing which complies with the provisions of Subsection 11.2.3 or an equivalent protective covering approved by the state engineer over and around the well casing at ground surface to a depth of at least two and one half (2.5) feet. If a pitless adapter is installed on the well, the bottom of the protective cover shall be placed above the pitless adapter/well connection. If the pitless adapter is placed in the protective casing, the protective casing shall extend below the pitless entrance in the well casing and be sealed both on the outside of the protective casing and between the protective casing and well casing. The protective cover shall be sealed in the borehole in accordance with the requirements of Subsection 11.4. The annular space between the protective cover and non-metallic casing shall also be sealed with acceptable materials in accordance with Subsection 11.4. A sanitary, weather-tight seal or a completely welded cap shall be placed on top of the protective cover, thus enclosing the well itself. If the sanitary seal is vented, screens shall be placed in the vent to prevent debris insects, and other animals from entering the well. This protective casing requirement does not apply to monitor wells. Figure 5 depicts this requirement.

R655-4-11.3 Casing Joints

11.3 Casing Joints.

11.3.1 General. All well casing joints shall be made water tight. In instances in which a reduction in casing diameter is made, there shall be enough overlap of the casings to prevent misalignment and to insure the making of an adequate seal in the annular space between casings to prevent the movement of unstable sediment or formation material into the well, in addition to preventing the degradation of the water supply by the migration of inferior quality water through the annular space between the two casings.

11.3.2 Steel Casing. All steel casing shall be screw-coupled or welded. If the joints are welded, the weld shall meet American Welding Society standards and be at least as thick as the wall thickness of the casing and shall consist of at least two beads for the full circumference of the joint and be fully penetrating. Spot welding of joints is prohibited.

11.3.3 Plastic Casing. All plastic well casing shall be mechanically screw coupled, chemically welded, cam-locked or lug coupled to provide water tight joints as per ANSI/ASTM F480-95. Metal screws driven into casing joints shall not be long enough to penetrate the inside surface of the casing. Metal screws should be used only when surrounding air temperatures are below 50 degrees Fahrenheit (F) which retards the normal setting of the cement. Solvent-welded joints shall not impart taste, odors, toxic substances, or bacterial contamination to the water in the well.

R655-4-11.4 Surface Seals and Interval Seals

Well Surface Seals and Interval Seals

11.4 Surface Seals and Interval Seals – General

11.4.1 General. Before the drill rig is removed from the drill site of a well, a surface seal shall be installed. Well casings shall be sealed to prevent the possible downward movement of contaminated surface waters in the annular space around the well casing. The seal shall also prevent the upward movement of artesian waters within the annular space around the well casing. Depending upon hydrogeologic conditions around the well, interval seals may need to be installed to prevent the movement of groundwater either upward or downward around the

well from zones that have been cased out of the well due to poor water quality or other reasons. The following surface and interval seal requirements apply equally to rotary drilled, cable tool drilled, bored, jetted, augered, and driven wells unless otherwise specified.

11.4.2 Seal Material.

11.4.2.1 General. The seal material shall consist of neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout as defined in Section R655-4-2. Use of sealing materials other than those listed above must be approved by the state engineer. Bentonite drilling fluid (drilling mud), dry drilling bentonite, or drill cuttings are not an acceptable sealing material. In no case shall drilling fluid (mud), drill cuttings, drill chips, or puddling clay be used, or allowed to fill, partially fill, or fall into the required sealing interval of a well during construction of the well. The annular space to be grouted must be protected from collapse and the introduction of materials other than grout. All hydrated sealing materials (neat cement grout, sand cement grout, bentonite grout) shall be placed by tremie pipe, pumping, or pressure from the bottom of the seal interval upwards in one continuous operation when placed below a depth of 30 feet or when placed below static groundwater level. Neat cement and sand cement grouts must be allowed to cure a minimum of 24 hours before well drilling, construction, or testing may be resumed. Allowable setting times may be reduced or lengthened by use of accelerators or retardants specifically designed to modify setting time, at the approval of the state engineer. The volume of annular space in the seal interval shall be calculated by the driller to determine the estimated volume of seal material required to seal the annular space. The driller shall place at least the volume of material equal to the volume of annular space, thus ensuring that a continuous seal is placed. The driller shall maintain the well casing centered in the borehole during seal placement using centralizers or other means to ensure that the seal is placed radially and vertically continuous. Neat cement and sand cement grout shall not be used for surface or interval seals with PVC and other approved non-metallic casing unless specific state engineer approval is obtained.

11.4.2.2 Bentonite Grout. Bentonite used to prepare grout for sealing shall have the ability to gel; not separate into water and solid materials after it gels; have a hydraulic conductivity or permeability value of 10E-7 centimeters per second or less; contain at least 20 percent solids by weight of bentonite, and have a fluid weight of 9.5 pounds per gallon or greater and be specifically designed for the purpose of sealing. In addition, if a bentonite grout is to be placed in the vadose zone (unsaturated interval), then clean rounded fine sand shall be added to the bentonite grout in order to increase the overall solids content and stabilize the grout from dehydrating and cracking in that interval. For 20% solids bentonite grout, at least 100 pounds of clean rounded fine sand shall be added. For 30% solids bentonite grout, at least 50 pounds of clean fine sand shall be added. Bentonite grout shall not be used for sealing intervals of fractured rock or sealing intervals of highly unstable material that could collapse or displace the sealing material, unless otherwise approved by the state engineer. Bentonite grout shall not be used as a sealing material where rapidly flowing groundwater might erode it. Bentonite or polymer drilling fluid (mud) does not meet the definition of a grout with respect to density, gel strength, and solids content and shall not be used for sealing purposes. At no time shall bentonite grout contain materials that are toxic, polluting, develop odor or color changes, or serve as a micro-bacterial nutrient. All bentonite grout shall be prepared and installed according to the manufacturer's instructions and these rules. All additives must be certified by a recognized certification authority such as NSF and approved by the state engineer. All bentonite used in any well shall be certified by NSF/ANSI approved standards for use in potable water supply wells, or equivalent standards as approved by the state engineer.

11.4.2.3 Unhydrated Bentonite. Unhydrated bentonite (e.g., granular, tabular, pelletized, or chip bentonite) may be used in the construction of well seals above a depth of 50 feet.

Unhydrated bentonite can be placed below a depth of 50 feet when placed inside the annulus of two casings, when placed using a tremie pipe, or by using a placement method approved by the state engineer. The bentonite material shall be specifically designed for well sealing and be within industry tolerances. All unhydrated bentonite used for sealing must be free of organic polymers and other contamination. Placement of bentonite shall conform to the manufacturer's specifications and instructions and result in a seal free of voids or bridges. Granular or powdered bentonite shall not be placed under water by gravity feeding from the surface. When placing unhydrated bentonite, a sounding or tamping tool shall be run in the sealing interval during pouring to measure fill-up rate, verify a continuous seal placement, and to break up possible bridges or cake formation.

11.4.3 Seal and Unperforated Casing Placement.

11.4.3.1 General Seal Requirements. Figure 1 illustrates the construction of a surface seal for a typical well. The surface seal must be placed in an annular space that has a minimum diameter of four (4) inches larger than the nominal size of the permanent well casing (This amounts to a 2-inch annulus). The surface seal must extend from land surface to a minimum depth of 30 feet. The completed surface seal must fully surround the permanent well casing, must be evenly distributed, free of voids, and extend to undisturbed or recompacted soil. In unconsolidated formations such as gravels, sands, or other unstable conditions when the use of drilling fluid or other means of keeping the borehole open are not employed, either a temporary surface casing with a minimum depth of 30 feet and a minimum nominal diameter of four (4) inches greater than the outermost permanent casing shall be utilized to ensure proper seal placement or the well driller shall notify the state engineer's office that the seal will be placed in a potentially unstable open borehole without a temporary surface casing by telephone or FAX in conjunction with the start card submittal in order to provide an opportunity for the state engineer's office to inspect the placement of the seal. If a temporary surface casing is utilized, the surface casing shall be removed in conjunction with the placement of the seal. Alternatively, conductor casing may be sealed permanently in place to a depth of 30 feet with a minimum 2-inch annular seal between the surface casing and borehole wall. If the temporary surface casing is to be removed, the surface casing shall be withdrawn as sealing material is placed between the outer-most permanent well casing and borehole wall. The sealing material shall be kept at a sufficient height above the bottom of the temporary surface casing as it is withdrawn to prevent caving of the borehole wall. If the temporary conductor casing is driven in place without a 2-inch annular seal between the surface casing and borehole wall, the surface casing shall be removed. Specific state engineer approval must be obtained on a case-by-case basis for any variation of these requirements. Surface seals and unperforated casing shall be installed in wells located in unconsolidated formation such as sand and gravel with minor clay or confining units; unconsolidated formation consisting of stratified layers of materials such as sand, gravel, and clay or other confining units; and consolidated formations according to the following procedures.

11.4.3.2 Unconsolidated Formation without Significant Confining Units. This includes wells that penetrate an aquifer overlain by unconsolidated formations such as sand and gravel without significant clay beds (at least six feet thick) or other confining formations. The surface seal must be placed in a 2-inch annular space to a minimum depth of 30 feet. Permanent unperforated casing shall extend at least to a depth of 30 feet and also extend below the lowest anticipated pumping level. Additional casing placed in the open borehole below the required depths noted above shall meet the casing requirements of Subsection 9.2 unless the casing is installed as a liner inside a larger diameter approved casing.

11.4.3.3 Unconsolidated Formation with Significant Confining Units. This includes wells that penetrate an aquifer overlain by clay or other confining formations that are at least six (6) feet

thick. The surface seal must be placed in a 2-inch annular space to a minimum depth of 30 feet and at least five (5) feet into the confining unit above the water bearing formation. Unperforated casing shall extend from ground surface to at least 30 feet and to the bottom of the confining unit overlying the water bearing formation. If necessary to complete the well, a smaller diameter casing, liner, or well screen may be installed below the unperforated casing. The annular space between the two casings shall be sealed with grout, bentonite, or a mechanical packer. Additional casing placed in the open borehole below the required depths noted above shall meet the casing requirements of Subsection 11.2 unless the casing is installed as a liner inside a larger diameter approved casing.

11.4.3.4 Consolidated Formation. This includes drilled wells that penetrate an aquifer, either within or overlain by a consolidated formation. The surface seal must be placed in a 2-inch annular space to a minimum depth of 30 feet and at least five (5) feet into competent consolidated formation. Unperforated permanent casing shall be installed to extend to a depth of at least 30 feet and the lower part of the casing shall be driven and sealed at least five (5) feet into the consolidated formation. If necessary to complete the well, a smaller diameter casing, liner, or well screen may be installed below the unperforated casing. The annular space between the two casings shall be sealed with grout, bentonite, or a mechanical packer. Additional casing placed in the open borehole below the required depths noted above shall meet the casing requirements of Subsection 11.2 unless the casing is installed as a liner inside a larger diameter approved casing.

11.4.3.5 Sealing Artesian Wells. Unperforated well casing shall extend into the confining stratum overlying the artesian zone, and shall be adequately sealed into the confining stratum to prevent both surface and subsurface leakage from the artesian zone. If leaks occur around the well casing or adjacent to the well, the well shall be completed with the seals, packers, or casing necessary to eliminate the leakage. The driller shall not move the drilling rig from the well site until leakage is completely stopped, unless authority for temporary removal of the drilling rig is granted by the state engineer, or when loss of life or property is imminent. If the well flows naturally at land surface due to artesian pressure, the well shall be equipped with a control valve so that the flow can be completely stopped. The control valve must be available for inspection by the state engineer at all times. All flowing artesian water supply wells shall be tested for artesian shut-in pressure in pounds per square inch and rate of flow in cubic feet per second, or gallons per minute, under free discharge conditions. This data shall be reported on the well log.

11.4.3.6 Exceptions: With state engineer approval, exceptions to minimum seal depths can be made for shallow wells where the water to be produced is at a depth less than 30 feet. In no case shall a surface seal extend to a total depth less than 10 feet below land surface.

11.4.4 Interval Seals. Formations containing undesirable materials (e.g., fine sand and silt that can damage pumping equipment and result in turbid water), contaminated groundwater, or poor quality groundwater must be sealed off so that the unfavorable formation cannot contribute to the performance and quality of the well. These zones, as well as zones with significantly differing pressures, must also be sealed to eliminate the potential of cross contamination or commingling between two aquifers of differing quality and pressure. Figure 4 illustrates this situation. Unless approved by the state engineer, construction of wells that cause the commingling or cross connection of otherwise separate aquifers is not allowed.

11.4.5 Other Sealing Methods. In wells where the above-described methods of well sealing do not apply, special sealing procedures can be approved by the state engineer upon written request by the licensed well driller.

R655-4-11.5 Special Requirements for Oversized and Gravel Packed Wells

Gravel Pack or Filter Material

11.5 This section applies to wells in which casing is installed in an open borehole without driving or drilling in the casing and an annular space is left between the borehole wall and well casing (e.g., mud rotary wells, flooded reverse circulation wells, air rotary wells in open bedrock).

11.5.1 Oversized Borehole. The diameter of the borehole shall be at least four (4) inches larger than the outside diameter of the well casing to be installed to allow for proper placement of the gravel pack and/or formation stabilizer and adequate clearance for grouting and surface seal installations. In order to accept a smaller diameter casing in any oversized borehole penetrating unconsolidated or stratified formations, the annular space must be sealed in accordance with Subsection 11.4. In order to minimize the risk of: 1) borehole caving or collapse; 2) casing failure or collapse; or 3) axial distortion of the casing, it is required that the entire annular space in an oversized borehole between the casing and borehole wall be filled with formation stabilizer such as approved seal material, gravel pack, filter material or other state engineer-approved materials. Well casing placed in an oversized borehole should be suspended at the ground surface until all formation stabilizer material is placed in order to reduce axial distortion of the casing if it is allowed to rest on the bottom of an open oversized borehole. In order to accept a smaller diameter casing, the annular space in an oversized borehole penetrating unconsolidated formations (with no confining layer) must be sealed in accordance with Subsection 11.4 to a depth of at least 30 feet or from static water level to ground surface, whichever is deeper. The annular space in an oversized borehole penetrating stratified or consolidated formations must be sealed in accordance with Subsection 11.4 to a depth of at least 30 feet or five (5) feet into an impervious strata (e.g., clay) or competent consolidated formation overlying the water producing zones back to ground surface, whichever is deeper. Especially in the case of an oversized borehole, the requirements of Subsection 11.4.4 regarding interval sealing must be followed.

11.5.2 Gravel Pack or Filter Material. The gravel pack or filter material shall consist of clean, well-rounded, chemically stable grains that are smooth and uniform. The filter material should not contain more than 2% by weight of thin, flat, or elongated pieces and should not contain organic impurities or contaminants of any kind. In order to assure that no contamination is introduced into the well via the gravel pack, the gravel pack must be washed with a minimum 100 ppm solution of chlorinated water or dry hypochlorite mixed with the gravel pack at the surface before it is introduced into the well (see Table 7 of these rules for required amount of chlorine material).

11.5.3 Placement of Filter Material. All filter material shall be placed using a method that through common usage has been shown to minimize a) bridging of the material between the borehole and the casing, and b) excessive segregation of the material after it has been introduced into the annulus and before it settles into place. It is not acceptable to place filter material by pouring from the ground surface unless proper sounding devices are utilized to measure dynamic filter depth, evaluate pour rate, and minimize bridging and formation of voids.

11.5.4 No Surface Casing Used. If no permanent conductor casing is installed, neat cement grout, sand cement grout, bentonite grout, or unhydrated bentonite seal shall be installed in accordance with Subsection 11.4. Figure 2 of these rules illustrates the construction of a typical well of this type.

11.5.5 Permanent Conductor Casing Used. If permanent conductor casing is installed, it shall be unperforated and installed and sealed in accordance with Subsection 11.4 as depicted in Figure 3 of these rules. After the gravel pack has been installed between the conductor casing and the well casing, the annular space between the two casings shall be sealed by either

welding a water-tight steel cap between the two casings at land surface or filling the annular space between the two casings with neat cement grout, sand cement grout, bentonite grout, or unhydrated bentonite from at least 50 feet to the surface and in accordance with Subsection 11.4. If a hole will be created in the permanent conductor casing in order to install a pitless adapter into the well casing, the annual space between the conductor casing and well casing shall be sealed to at least a depth of thirty (30) feet with neat cement grout, sand cement grout, bentonite grout, or unhydrated bentonite. A waterproof cap or weld ring sealing the two casings at the surface by itself without the annular seal between the two casings is unacceptable when a pitless adapter is installed in this fashion. Moreover in this case, the annular space between the surface casing and well casing must be at least 2 inches in order to facilitate seal placement.

11.5.6 Gravel Feed Pipe. If a gravel feed pipe, used to add gravel to the gravel pack after well completion, is installed, the diameter of the borehole in the sealing interval must be at least four (4) inches in diameter greater than the permanent casing plus the diameter of the gravel feed pipe. The gravel feed pipe must have at least 2-inches of seal between it and the borehole wall. The gravel feed pipe must extend at least 18 inches above ground and must be sealed at the top with a watertight cap or plug (see Figure 2).

11.5.7 Other Gravel Feed Options. If a permanent surface casing or conductor casing is installed in the construction of a filter pack well, a watertight, completely welded, steel plate (weld ring) at least 3/16 of an inch in thickness shall be installed between the inner production casing and the outer surface/conductor casing at the wellhead. A watertight fill port with threaded cap may be installed for the purpose of placing additional filter pack material in the well.

R655-4-11.6 Protection of the Aquifer

11.6 Protection of the Aquifer

11.6.1 Drilling Fluids and LCMs. The well driller shall take due care to protect the producing aquifer from clogging or contamination. Organic substances or phosphate-based substances shall not be introduced into the well or borehole during drilling or construction. Every effort shall be made to remove all substances and materials introduced into the aquifer or aquifers during well construction. "Substances and materials" shall mean all bentonite- and polymer-based drilling fluids, filter cake, and any other inorganic substances added to the drilling fluid that may seal or clog the aquifer. All polymers and additives used in any well shall be certified by NSF/ANSI approval standards for use in potable water supply wells, or equivalent standards as approved by the state engineer. The introduction of lost circulation materials (LCM's) during the drilling process shall be limited to those products which will not present a potential medium for bacterial growth or contamination. Only LCM's which are non-organic, which can be safely broken down and removed from the borehole, may be utilized. This includes, but is not limited to, paper/wood products, brans, hulls, grains, starches, hays/straws, and proteins. This is especially important in the construction of wells designed to be used as a public water system supply. All polymers and additives used in any well shall be certified by NSF/ANSI approval standards for use in potable water supply wells, or equivalent standards as approved by the Division. The product shall be clearly labeled as meeting these standards. Polymers and additives must be designed and manufactured to meet industry standards to be nondegrading and must not act as a medium which will promote growth of microorganisms.

11.6.2 Containment of Drilling Fluid. Drilling or circulating fluid introduced into the drilling process shall be contained in a manner to prevent surface or subsurface contamination and to prevent degradation of natural or man-made water courses or impoundments. Rules

regarding the discharges to waters of the state are promulgated under R317-8-2 of the Utah Administrative Code and regulated by the Utah Division of Water Quality (Tel. 801-536-6146). Pollution of waters of the state is a violation of the Utah Water Quality Act, Utah Code Annotated Title 19, Chapter 5.

11.6.3 Mineralized, Contaminated or Polluted Water. Whenever a water bearing stratum that contains nonpotable mineralized, contaminated or polluted water is encountered, the stratum shall be adequately sealed off so that contamination or co-mingling of the overlying or underlying groundwater zones will not occur (see Figure 4) Water bearing zones with differing pressures must also be isolated and sealed off in the well to avoid aquifer depletion, wasting of water, and reduction of aquifer pressures.

11.6.4 Down-hole Equipment. All tools, drilling equipment, and materials used to drill, repair, renovate, clean, or install a pump in a well shall be free of contaminants prior to beginning well construction or other in-well activity. Contaminants include lubricants, fuel, bacteria, etc. that will reduce the well efficiency, and any other item(s) that will be harmful to public health and/or the resource or reduce the life of the water well. It is recommended that excess lubricants placed on drilling equipment be wiped clean prior to insertion into the borehole.

11.6.5 Well Disinfection and Chlorination of Water. No contaminated or untreated water shall be placed in a well during construction. Water should be obtained from a chlorinated municipal system. Where this is not possible, the water must be treated to give at least 100 parts per million free chlorine residual. Upon completion of a well or work on a well, the driller or pump installer shall disinfect the well using accepted disinfection procedures to give at least 100 parts per million free chlorine residual equally distributed in the well water from static level to the bottom of the well. A chlorine solution designated for potable water use prepared with either calcium hypochlorite (powdered, granular, or tablet form) or sodium hypochlorite in liquid form shall be used for water well disinfection. Off-the-shelf chlorine compounds intended for home laundry use, pool or fountain use should not be used if they contain additives such as antifungal agents, silica ("Ultra" brands), scents, etc. Table 7 provides the amount of chlorine compound required per 100 gallons of water or 100 feet linear casing volume of water to mix a 100 parts per million solution. Disinfection situations not depicted in Table 7 must be approved by the state engineer. Additional recommendations and guidelines for water well system disinfection are available from the state engineer upon request.

TABLE 6
AMOUNT OF CHLORINE COMPOUND FOR EACH 100 FEET OF WATER STANDING IN WELL (100 ppm solution)

Well Diameter (inches)	Ca-HyCLT* (25% HOCL) (ounces)	Ca-HyCLT (65% HOCL) (ounces)	Na-HyCLT** (12-trade %) (fluid ounces)	Liquid CL*** (100% C12) (lbs)
2	1.00	0.50	3.5	0.03
4	3.50	1.50	7.0	0.06
6	8.00	3.00	16.0	0.12
8	14.50	5.50	28.0	0.22
10	22.50	8.50	45.0	0.34
12	32.50	12.00	64.0	0.50
14	44.50	16.50	88.0	0.70
16	58.00	26.00	112	0.88
20	90.50	33.00	179	1.36

For Every 100 gal. of water add:	5.50	2.00	11.5	0.09

* Calcium Hypochlorite (solid)
** Sodium Hypochlorite (liquid)
*** Liquid Chloride

R655-4-11.7 Special Requirements

11.7.1 Explosives. Explosives used in well construction shall not be detonated within the section of casing designed or expected to serve as the surface seal of the completed well, whether or not the surface seal has been placed. If explosives are used in the construction of a well, their use shall be reported on the official well log. In no case shall explosives, other than explosive shot perforators specifically designed to perforate steel casing, be detonated inside the well casing or liner pipe.

11.7.2 Access Port. Every well shall be equipped with a usable access port so that the position of the water level, or pressure head, in the well can be measured at all times.

11.7.3 Completion or Abandonment. A licensed driller shall not remove his drill rig from a well site unless the well is completed or abandoned. Completion of a well shall include all surface seals, gravel packs or curbs required. Dry boreholes, or otherwise unsuccessful attempts at completing a well, shall be properly abandoned in accordance with Section R655-4-14. Upon completion, all wells shall be equipped with a watertight, tamper-resistant casing cap or sanitary seal.

11.7.4 Surface Security. If it becomes necessary for the driller to temporarily discontinue the drilling operation before completion of the well or otherwise leave the well or borehole unattended, the well and/or borehole must be covered securely to prevent contaminants from entering the casing or borehole and rendered secure against entry by children, vandals, domestic animals, and wildlife.

11.7.5 Pitless Adapters/Units. Pitless adapters or units are acceptable to use with steel well casing as long as they are installed in accordance with manufacturers recommendations and specifications as well as meet the Water Systems Council Pitless Adapter Standard (PAS-97) which are incorporated herein by reference and are available from Water Systems Council, 13 Bentley Dr., Sterling, VA 20165, phone 703-430-6045, fax 703-430-6185 (watersystemscouncil.org). The pitless adaptor, including the cap or cover, casing extension, and other attachments, must be so designed and constructed to be secure, water tight, and to prevent contamination of the potable water supply from external sources. Pitless wellhead configurations shall have suitable access to the interior of the well in order to measure water level and for well disinfection purposes. Pitless configurations shall be of watertight construction throughout and be constructed of materials at least equivalent to and having wall thickness and strength compatible to the casing. Pitless adapters or units are not recommended to be mounted on PVC well casing. If a pitless adapter is to be used with PVC casing, it should be designed for use with PVC casing, and the driller should ensure that the weight of the pump and column do not exceed the strength of the PVC well casing. If it is known that a pitless adapter/unit will be installed on a well, a cement grout seal shall not be allowed within the pitless unit or pitless adaptor sealing interval as the well is being constructed. The pitless adapter or unit sealing interval shall be sealed with unhydrated bentonite as the well is constructed and before pitless installation. Upon pitless adapter/unit installation, the surface seal below the pitless connection shall be protected and maintained. After the pitless adapter/unit has been installed, the associated excavation around the well from the pitless connection to ground surface shall be backfilled and compacted with low permeability fill that

includes clay. The pitless adapter or unit, including the cap or cover, pitless case and other attachments, shall be designed and constructed to be watertight to prevent the entrance of contaminants into the well from surface or near-surface sources.

11.7.6 Hydraulic Fracturing. The hydraulic fracturing pressure shall be transmitted through a drill string and shall not be transmitted to the well casing. Hydraulic fracturing intervals shall be at least 20 feet below the bottom of the permanent casing of a well. All hydraulic fracturing equipment shall be thoroughly disinfected with a 100 part per million chlorine solution prior to insertion into the well. The driller shall include the appropriate hydraulic fracturing information on the well log including methods, materials, maximum pressures, location of packers, and initial/final yields. In no case shall hydrofacturing allow commingling of waters within the well bore. Clean sand or other material (propping agents) approved by the Division may be injected into the well to hold the fractures open when pressure is removed.

11.7.7 Static Water Level, Well Development, and Well Yield. To fulfill the requirements of Subsection R655-4-4.5.2, new wells designed to produce water shall be developed to remove drill cuttings, drilling mud, or other materials introduced into the well during construction and to restore the natural groundwater flow to the well to the extent possible. After a water production well is developed, a test should be performed to determine the rate at which groundwater can be reliably produced from the well. Following development and testing, the static water level in the well should also be measured. Static water level, well development information, and well yield information shall be noted on the official submittal of the Well Log by the well driller.

11.7.8 Packers. Packers shall be of a material that will not impart taste, odor, toxic substances or bacterial contamination to the water in the well.

11.7.9 Screens. Screens must be constructed of corrosion-resistant material and sufficiently strong to withstand stresses encountered during and after installation. Screen slot openings, screen length, and screen diameter should be sized and designed to provide sufficient open area consistent with strength requirements to transmit sand-free water from the well. Screens should be installed so that exposure above pumping level will not occur.

11.7.10 Openings in the Casing. There shall be no opening in the casing wall between the top of the casing and the bottom of the required casing seal except for pitless adapters, measurement access ports, and other approved openings installed in conformance with these standards. In no case shall holes be cut in the casing wall for the purpose of lifting or lowering casing into the well bore unless such holes are properly welded closed and watertight prior to placement into the well bore.

11.7.11 Casing vents. If a well requires venting, it must terminate in a down-turned position at least 18-inches above ground (land) level, at or above the top of the casing or pitless unit and be covered with a 24 mesh corrosion-resistant screen.

R655-4-12.1.2 Public Water Supply Wells

12.1.2 Public Water Supply Wells. Public water supply wells are subject to the minimum construction standards outlined in Section R655-4-11 in addition to the requirements established by the Department of Environmental Quality, Division of Drinking Water under Rules R309-515 and R309-600. Rules and requirements in R309-515 and R309-600 are regulated by the Division of Drinking Water and not by the Division of Water Rights and may include a preliminary evaluation report related to drinking water source protection, well plan and specification review and approval, and mandatory grout seal inspection (The Division of Drinking Water should be contacted to determine specific and current rules and requirements).

R655-4-13 Deepening, Rehabilitation, and Renovation of Wells

This provision is not applicable to the project.

13.1 Sealing of Casing.

13.1.1 If in the repair of a drilled well, the old casing is withdrawn, the well shall be recased and resealed in accordance with the rules provided in Subsection R655-4-11(11.4).

13.2 Inner Casing.

13.2.1 If an inner casing is installed to prevent leakage of undesirable water into a well, the space between the two well casings shall be completely sealed using packers, casing swedging, pressure grouting, etc., to prevent the movement of water between the casings.

13.3 Outer Casing.

13.3.1 If the "over-drive" method is used to eliminate leakage around an existing well, the casing driven over the well shall meet the minimum specifications listed in Subsection R655-4-11(11.4).

13.4 Artesian Wells.

13.4.1 If upon deepening an existing well, an artesian zone is encountered, the well shall be cased and completed as provided in Subsection R655-4-11(11.4).

13.5 Drilling in a Dug Well.

13.5.1 A drilled well may be constructed through an existing dug well provided that:

13.5.1.1 Unperforated Casing Requirements. An unperforated section of well casing extends from a depth of at least ten (10) feet below the bottom of the dug well and at least 20 feet below land surface to above the maximum static water level in the dug well.

13.5.1.2 Seal Required. A two foot thick seal of neat cement grout, sand cement grout, or bentonite grout is placed in the bottom of the dug well so as to prevent the direct movement of water from the dug well into the drilled well.

13.5.1.3 Test of Seal. The drilled well shall be pumped or bailed to determine whether the seal described in Subsection R655-4-13(13.5.1.2) is adequate to prevent movement of water from the dug well into the drilled well. If the seal leaks, additional sealing and testing shall be performed until a water tight seal is obtained.

13.6 Well Rehabilitation and Cleaning.

13.6.1 Tools used to rehabilitate or clean a well shall be cleaned, disinfected, and free of contamination prior to placement in a well.

13.6.2 The driller shall use rehabilitation and cleaning tools properly so as not to permanently damage the well or aquifer. If the surface seal is damaged or destroyed in the process of rehabilitation or cleaning, the driller shall repair the surface seal to the standards set forth in Subsection R655-4-11(11.4).

13.6.3 Debris, sediment, and other materials displaced inside the well and surrounding aquifer as a result of rehabilitation or cleaning shall be completely removed by pumping, bailing, well development, or other approved methods.

13.6.4 Detergents, chlorine, acids, or other chemicals placed in wells for the purpose of increasing or restoring yield, shall be specifically designed for that purpose and used according to the manufacturer's recommendations.

13.6.5 Any renovation, rehabilitation, cleaning, or other work on a well that requires alteration of the well itself shall be conducted by a licensed well driller.

13.6.6 Following completion of deepening, renovation, rehabilitation, cleaning, or other work on a well, the well shall be properly disinfected in accordance with Subsection R655-4-11(11.6.5).

R655-4-14 Abandonment of Wells

14.1 Temporary Abandonment.
14.1.1 When any well is temporarily removed from service, the top of the well shall be sealed with a tamper resistant, water-tight cap or seal. If a well is in the process of being drilled and is temporarily abandoned, the well shall be sealed with a tamper resistant, water-tight cap or seal and a surface seal installed in accordance with Subsection R655-4-11(11.4). The well may be temporarily abandoned during construction for a maximum of 90 days. After the 90 day period, the temporarily abandoned well shall be completed as a well that meets the standards of Section 11 or permanently abandoned in accordance with the following requirements, and an official well abandonment report (abandonment log) must be submitted in compliance with Section R655-4-4.
14.2 Permanent Abandonment.
14.2.1 The rules of this section apply to the abandonment of the type of wells listed in Subsection R655-4-1(1.2) including private water wells, public supply wells, monitor wells, cathodic protection wells, and heating or cooling exchange wells. A licensed driller shall notify the state engineer prior to commencing abandonment work of an existing well and submit a complete and accurate abandonment log following abandonment work in accordance with Section R655-4-4 of these rules. Prior to commencing abandonment work, the driller shall obtain a copy of the well log of the well proposed to be abandoned from the well owner or the state engineer, if available, in order to determine the proper abandonment procedure. Any well that is to be permanently abandoned shall be completely filled from bottom to top in a manner to prevent vertical movement of water within the borehole as well as preventing the annular space surrounding the well casing from becoming a conduit for possible contamination of the groundwater supply. A well driller who wishes to abandon a well in a manner that does not comply with the provisions set forth in this section must request approval from the state engineer.
14.3 License Required.
14.3.1 Well abandonment shall be accomplished under the direct supervision of a currently licensed water well driller who shall be responsible for verification of the procedures and materials used.
14.4 Acceptable Materials.
14.4.1 Neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout in accordance with Section R655-4-11.4 shall be used to abandon wells and boreholes. Other sealing materials or additives, such as fly ash, may be used in the preparation of grout upon approval of the state engineer. Drilling mud or drill cuttings shall not be used as any part of a sealing materials for well abandonment. The liquid phase of the abandonment fluid shall be water from a potable municipal system or disinfected in accordance with Subsection R655-4-11(11.6.5).
14.5 Placement of Materials.
14.5.1 Neat cement and sand cement grout shall be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The sealing material shall be placed by the use of a grout pipe, tremie line, dump bailer or equivalent in order to avoid freefall, bridging, or dilution of the sealing materials or separation of aggregates from sealants. Sealing material shall not be installed by freefall (gravity) unless the interval to be sealed is dry and no deeper than 30 feet below ground surface. If the well to be abandoned is a flowing artesian well, the well may be pressure grouted from the surface. The well should be capped immediately after placement of seal materials to allow the seal material to set up and not flow out of the well.
14.5.2 Bentonite-based abandonment products shall be mixed and placed according to manufacturer's recommended procedures and result in a seal free of voids or bridges.

Granular or powered bentonite shall not be placed under water. When placing unhydrated bentonite, a sounding or tamping tool shall be run in the sealing interval during pouring to measure fill-up rate, verify a continuous seal placement, and to break up possible bridges or cake formation.

14.5.3 If seal material settlement occurs during placement and set up, the top of the abandoned well casing or borehole shall be topped off with approved sealing material until the seal top remains at the natural ground surface.

14.5.4 Abandonment materials placed opposite any non-water bearing intervals or zones shall be at least as impervious as the formation or strata prior to penetration during the drilling process.

14.5.5 Prior to well or borehole abandonment, all pump equipment, piping, and other debris shall be removed to the extent possible. The well shall also be sounded immediately before it is plugged to make sure that no obstructions exist that will interfere with the filling and sealing. If the well contains lubricating oil that has leaked from a turbine shaft pump, it shall be removed from the well prior to abandonment and disposed of in accordance with applicable state and federal regulations.

14.5.6 Verification shall be made that the volume of sealing and fill material placed in a well during abandonment operations equals or exceeds the volume of the well or borehole to be filled and sealed.

14.6 Termination of Casing.

14.6.1 The casings of wells to be abandoned shall be severed to the natural ground surface or deeper if necessitated by development of the area. If the casing is severed below ground surface, compacted native material shall be placed above the abandoned well upon completion.

14.7 Abandonment of Artesian Wells.

14.7.1 A neat cement grout, sand-cement grout, or concrete plug shall be placed in the confining stratum overlying the artesian zone so as to prevent subsurface leakage from the artesian zone. The remainder of the well shall be filled with sand-cement grout, neat cement grout, bentonite abandonment products, or bentonite grout. The uppermost ten (10) feet of the well shall be abandoned as required in Subsection R655-4-14(14.5.3).

14.8 Abandonment of Drilled and Jetted Wells.

14.8.1 A neat cement grout or sand cement grout plug shall be placed opposite all perforations, screens or openings in the well casing. The remainder of the well shall be filled with cement grout, neat cement, bentonite abandonment products, concrete, or bentonite slurry. The uppermost ten feet of the well shall be abandoned as required in Subsection R655-4-14(14.5.3).

14.9 Abandonment of Gravel Packed Wells.

14.9.1 All gravel packed wells shall be pressure grouted throughout the perforated or screened section of the well. The remainder of the well shall be filled with sand cement grout, neat cement grout, bentonite abandonment products, or bentonite grout. If gravel pack extends above or below the perforated/screened interval in the annular space between the casing and borehole wall, additional perforations in that blank interval of casing shall be required. The uppermost ten feet of the well shall be abandoned as required in Subsection R655-4-14(14.5.3).

14.10 Removal of Casing.

14.10.1 Where possible, it is recommended that the well casing be removed during well abandonment, and when doing so, the abandonment materials shall be placed from the bottom of the well or borehole progressively upward as the casing is removed. The well shall be sealed with sand cement grout, neat cement grout, bentonite abandonment products, or bentonite grout. In the case of gravel packed wells, the entire gravel section shall be pressure grouted.

The uppermost ten feet of the well shall be abandoned as required in Subsection R655-4-14(14.5.3).

14.11 Replacement Wells.

14.11.1 Wells which are to be removed from operation and replaced by the drilling of a new well under an approved replacement application, shall be abandoned in a manner consistent with the provisions of Section R655-4-14 before the rig is removed from the site of the newly constructed replacement well, unless written authorization to remove the rig without abandonment is provided by the state engineer. Also refer to the requirements provided in Subsection R655-4-4(4.4).

14.12 Abandonment of Cathodic Protection Wells.

14.12.1 The general requirements for permanent well abandonment in accordance with Section R655-4-14 shall be followed for the abandonment of cathodic protection wells.

14.12.2 A cathodic protection well shall be investigated before it is destroyed to determine its condition, details of its construction and whether conditions exist that will interfere with filling and sealing.

14.12.3 Casing, cables, anodes, granular backfill, conductive backfill, and sealing material shall be removed as needed, by re-drilling, if necessary, to the point needed to allow proper placement of abandonment material. Casing that cannot be removed shall be adequately perforated or punctured at specific intervals to allow pressure injection of sealing materials into granular backfill and all other voids that require sealing.

R655-4-4 Well Driller Requirements

Well Videotaping

Well videotaping is required for the project.

R655-4-15 Monitor Well Construction Standards

This provision is not applicable to the project.

15.2 Installation and Construction.

15.2.1 Materials and Equipment Contaminant-Free. All material used in the installation of monitor wells shall be contaminant-free when placed in the ground. Drilling equipment shall be clean and contaminant free in accordance with Subsection R655-4-11(11.6.4). During construction contaminated water should not be allowed to enter contaminant-free geologic formations or water bearing zones.

15.2.2 Borehole Integrity. Some minor cross-contamination may occur during the drilling process, but the integrity of the borehole and individual formations must then be safeguarded from permanent cross connection.

15.2.3 Casing and Screen. The well casing should be perforated or screened and filter packed with sand or gravel where necessary to provide adequate sample collection at depths where appropriate aquifer flow zones exist. The casing and screen selected shall not affect or interfere with the chemical, physical, radiological, or biological constituents of interest. Screens in the same well shall not be placed across separate water bearing zones in order to minimize interconnection, aquifer commingling, and cross contamination. Screens in a nested well can be placed in separate water bearing zones as long as the intervals between the water bearing zones are appropriately sealed and aquifer cross connection and commingling does not occur. Monitor well casing and screen shall conform to ASTM standards, or consist of at least 304 or 316 stainless steel, PTFE (Teflon), or Schedule 40 PVC casing.

15.2.4 Gravel/Filter Pack. If installed, the gravel or filter pack should generally extend two (2) feet to ten (10) feet above screened or perforated areas to prevent the migration of the sealing material from entering the zones being sampled. Gravel or filter pack material shall meet the

requirements of Subsection R655-4-11(11.5.2). Gravel/filter pack for monitoring wells does not require disinfection. Drill cutting should not be placed into the open borehole annulus. The well driller shall ensure that a bridge or voids do not occur in the annular space during the placement of the gravel pack by means of a sounding device or other mechanism.

15.2.5 Annular Seal. All monitor wells constructed shall have a continuous surface seal, which seals the annular space between the borehole and the permanent casing, in accordance with the provisions in Section R655-4-11. The surface seal depth requirements of Section R655-4-11 do not apply to monitor wells. The surface seal may be more or less than 50 feet depending on the screen/perforation and/or gravel pack interval. Seals shall also be constructed to prevent interconnection and commingling of separate aquifers penetrated by the well, prevent migration of surface water and contaminations into the well and aquifers, and shall provide casing stability. The seal shall have a minimum diameter of four inches larger than the nominal size of the permanent casing, and shall extend from land surface to the top of the filter pack. After the permanent casing and filter pack (optional) has been set in final position, a layer of bentonite or fine sand (e.g., mortar sand) shall be placed on top of the filter pack to maintain separation between the seal material and the screened interval in order to insure that the seal placement will not interfere with the filter pack. The remaining annular space shall be filled to land surface in a continuous operation with unhydrated bentonite, neat cement grout, sand-cement grout, or bentonite grout. Only potable water should be used to hydrate any grout or slurry mixture. The completed annular space shall fully surround the permanent casing, be evenly distributed, free of voids, and extend from the permanent casing to undisturbed or recompacted soil. All sealing materials and placement methods shall conform to the standards in Section R655-4-2 and Subsection R655-4-11(11.4). The well driller shall ensure that a bridge or voids do not occur in the annular space during the placement of the seal.

15.2.6 Cuttings, Decon Water, Development Water, and Other IDW. Drill cuttings, decontamination (Decon) water, monitor well development water, and other investigation derived waste (IDW) shall be managed and disposed of in accordance with applicable state and federal environmental regulations. It is the responsibility of the driller to know and understand such requirements.

15.3 Minimum Surface Protection Requirements.

15.3.1 If a well is cased with metal and completed above ground surface, a locking water resistant cap shall be installed on the top of the well.

15.3.2 If the well is not cased with metal and completed above ground surface, a protective metal casing shall be installed over and around the well. The protective casing shall be cemented at least two feet into the ground around the nonmetallic casing. A water tight cap shall be installed in the top of the well casing. A locking cap shall be installed on the top of the protective casing.

15.3.3 Monitor wells completed above ground and potentially accessible to vehicular damage shall be protected in the following manner. At least three metal posts, at least three inches in diameter, shall be cemented in place around the casing. Each post shall extend at least three feet above and two feet below ground surface. A concrete pad may be installed to add protection to the surface completion. If installed, the concrete pad shall be at least four (4) inches thick and shall slope to drain away from the well casing. The base shall extend at least two (2) feet laterally in all directions from the outside of the well boring. When a concrete pad is used, the well seal may be part of the concrete pad.

15.3.4 If the well is completed below land surface, a water tight cap with a lock shall be attached to the top of the well casing. A metal monument or equivalent shall be installed over and around the well. The monument shall serve as a protective cover and be installed level with the land surface and be equipped with a waterproof seal to prevent inflow of any water or

contaminants. Drains will be provided, when feasible, to keep water out of the well and below the well cap. The monument and cover must be designed to withstand the maximum expected load.

15.4 Abandonment.

15.4.1 Abandonment of monitor wells shall be completed in compliance with the provisions of Section R655-4-14. The provisions of Section R655-4-14 are not required for the permanent abandonment of monitor wells completed at a depth of 30 feet below natural ground surface.

R655-4-16. Pump Installation and Repair.

16.1 Pump installation practices. All pump installations shall be completed in such a manner as to prevent waste and contamination of groundwater by pollution material entering the well from pumping equipment, casing connectors, fittings, piping, sanitary seals or caps.

16.2 Surface Seal. If in the process of pump installation or repair, the well's surface seal is disturbed or damaged, it shall be repaired and resealed in accordance with the standards provided in Subsection R655-4-11(11.4).

16.3 Tools, Equipment, and Materials. Down-hole tools and equipment used in performance of pump installation and repair shall be cleaned, disinfected, and free of contamination prior to placement in a well. All tools, drilling equipment, and materials used to drill a well shall be free of contaminants prior to beginning pump-related work. Contaminants include lubricants, fuel, bacteria, etc. that will reduce the well efficiency, and any other item(s) that will be harmful to public health and/or the resource or reduce the life of the water well. It is recommended that excess lubricants placed on equipment be wiped clean prior to insertion into the well. Thread Compounds, Sealants, and Lubricants must not exceed the maximum contaminant levels for chemicals, taste, and odor. The licensee shall use pump-related tools and equipment properly so as not to permanently damage the well or aquifer.

16.4 Disinfection. Following completion of pump installation and repair work on a well, the well, pump, and in-well discharge piping shall be properly disinfected in accordance with Subsection R655-4-11(11.6.5).

16.5. Product, material, and Process Standards. Any product, material or procedure designed for use related to pump installation and repair of water production or non-production wells, which has received certification and approval for its intended use by the National Sanitation Foundation (NSF) under ANSI/NSF Standard 60 or 61, the American Society for Testing Materials (ASTM), the American Water Works Association (AWWA) or the American National Standards Institute (ANSI) may be utilized. Other products, materials or procedures may also be utilized for their intended purpose upon manufacturers certification that they meet or exceed the standards or certifications referred to in this section and upon state engineer approval. Organic substances shall not be introduced into the well or borehole during pump installation and repair work.

16.6 Surface Completions. Pump installers shall leave the well surface completion upon completion of pump installation/repair work in accordance with the standards in Subsection R655-4-11 as it pertains to casing stick up, steel/PVC casing extensions, sanitary capping and venting, and protective casings. Upon completion, all wells shall be equipped with a watertight, tamper-resistant casing cap or sanitary seal.

16.7 Flowing Artesian Wells. In accordance with Subsection R655-4-11(11.4.3.5, artesian wells that flow naturally at the surface, the well shall be equipped with a control valve so that the flow can be completely stopped. The control valve must be available for inspection by the state engineer at all times.

16.8 Seals Between Casings. If the well is constructed of multiple casing strings at or near the ground surface and if a pitless adapter/unit is installed, the standards of Subsection R655-4-11(11.5.5) shall be employed to ensure proper sealing between casings is maintained.

16.9 Water Level and Flow Measurement. Following pump installation and repair work, the well shall be left in such a manner to allow for access to water level measurements in accordance with R655-4-11(11.7.2). After pump installation and repair work is completed on a well, the static water level should be measured after which a test should be performed to determine the rate at which groundwater can be reliably produced from the well. Pumping water level should be measured and recorded during this test. Static water level and well testing information shall be noted on the official submittal of the Pump Log by the pump installer or well driller.

16.10 Surface Security. If it becomes necessary for the pump installer to temporarily discontinue operation on a well before completion or otherwise leave the well unattended, the well must be covered securely to prevent contaminants from entering the casing and rendered secure against entry by children, vandals, domestic animals, and wildlife.

16.11 Above-grade connections. An above-grade connection into the top or side of a well casing shall be at least eighteen inches (18") above the land surface and shall be constructed so as to exclude dirt or other foreign matter by at least one of the following methods, as may be applicable:

(A) Threaded connection;

(B) Welded connection;

(C) Expansion sealer;

(D) Bolted flanges with rubber gaskets;

(E) Overlapping well cap; or

(F) If a water well pump is mounted or sealed on a concrete pedestal, the casing shall extend at least to the top of the pedestal and at least eighteen inches (18") above the land surface.

16.12 Pitless Connections. Pitless adapters and units shall be installed in accordance with the standards set forth in Subsection R655-4-11(11.7.5). Pitless adapters shall be installed below the frost line. A below-ground connection shall not be submerged in water at the time of installation. Holes cut in the casing through which the pitless adapters are installed must be sized and constructed so as to guarantee a watertight seal with the pitless adapter in place.

16.13 Backflow Protection. When a check valve or foot valve is not a part of the pump, a check valve or back-siphon prevention device shall be installed on the pump discharge line within the well or beyond the well to eliminate the opportunity for contaminated water to backflush into the well. Such device must be designed to direct or isolate the water flow to prevent water in the distribution line from running back down the well during removal or repair to the pump and pumping equipment. When a flow meter is installed on a well the meter must be located downstream from the backflow preventer and be placed in accordance with manufacturer spacing specifications.

16.14 Hand Pumps. Hand pumps shall be of the force type equipped with a packing gland around the pump rod, a delivery spout which is closed and downward directed, and a one-piece bell-type base which is part of the pump stand or is attached to the pump column in a watertight manner. The bell base of the pump shall be bolted with a gasket to a flange which is securely attached to the casing or pipe sleeve.

16.15 Pumping Water Level. In a screened or perforated well, the well pump setting and suction inlet shall be located so that the pumping level of the water cannot be drawn below the top of the screen.

16.16 Pump and Column/Drop Pipe Removal. During any repair or installation of a water well pump, the licensed installer shall make a reasonable effort to maintain the integrity of ground

water and to prevent contamination by elevating the pump column and fittings, or by other means suitable under the circumstances.

KEY: water wells, pump installers, well drillers license
Date of Enactment or Last Substantive Amendment: April 9, 2018
Notice of Continuation: August 1, 2014
Authorizing, and Implemented or Interpreted Law: 73-3

ATTACHMENT D
WELL DRILLING FACT SHEET REGARDING DISCHARGE

UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY
WATER
QUALITY

Fact Sheet for Water Discharges from Drilling Operations

Updated June 2025

Background

Utah Administrative Code (UAC) R317-8-2 requires a Utah Pollutant Discharge Elimination System (UPDES) permit for the discharge of pollutants from any point source into a Water of the State. Well drilling operations are not exempt from this requirement. Well drilling operations that require discharging into waters, including all surface water, (such as storm drains, ditches, channels, wetlands), or groundwater, must obtain coverage to discharge before initiating these activities.

Permit Coverage Options

Several permitting options may apply to well drilling discharges based on discharge type and location. Permit options include:

- **Construction Dewatering Hydrostatic Testing General Permit** Covers the discharges of uncontaminated groundwater or surface water from activities such as construction, pipeline testing, and drinking water vessel disinfection to surface water.
- **Treated Groundwater Surface Water General Permit** Covers the discharge of treated groundwater or surface water that contains pollutants other than what is usually encountered by construction operations to surface water.
- **Individual Permits**- Covers discharges to a surface water that can not be covered under a UPDES General Permit. These are written specifically to the project and receiving waterbody.
- **Groundwater Discharge Permits**- Covers the discharge of pollutants to ground water. UAC R317-6-6.2 provides guidance on groundwater pollutant concentrations and permitting requirements.
- **Permit by Rule Facilities**- Covers discharges to groundwater that will meet groundwater quality standards, where the impacts have been determined to be de-minimus by DWQ.

Resources can be found on the DWQ website deq.utah.gov/division-water-quality

Questions? (801) 536-4300 • WQInfoData@utah.gov