ADDENDUM NO. 2
TO THE CONTRACT DOCUMENTS FOR
Well Number 8 Pump Building

To All Planholders and/or Prospective Bidders:

The following clarifications, changes, additions, and/or deletions are hereby made a part of the Contract Documents for the construction of the Well Number 8 Pump Building as fully and completely as if the same were fully set forth therein:

A. PART 1, BIDDING REQUIREMENTS
   1. Bidders must submit bids by 2:00 p.m. on Thursday, October 16, 2025.

B. PART 2, CONTRACT FORMS
   1. Attached Bid Schedule_Addendum 2 replaces Bid Schedule (addition of Bid Item 16 – "Video Well Log" and Bid Item 17 – "Brush and Bail 20-inch Casing").

C. PART 3, CONDITIONS OF THE CONTRACT
   1. Attached Contract_Addendum 2 replaces Contract (Article 3 – Commencement and Completion was modified as follows, replace "210 calendar days" with "420 calendar days").

D. PART 4, SPECIFICATIONS
   1. Attached Section 01 22 00 Measurement and Payment_Addendum 2 replaces Section 01 22 00 Measurement and Payment in its entirety.

   2. Section 08 10 00 Doors, Frames, and Hardware: Add paragraph 2.2(O): Security Card Access: Yamas Controls to furnish and install security card access hardware.

   3. Section 26 29 23 Variable Frequency Drives: 2.2.C. Change "200 horsepower" to "150 horsepower".

   4. 26 32 13.13 Diesel-Engine Generator Sets:
      A. Clarification: No sub-base fuel tank is required. Fuel tank to be a separate con-vault fuel tank installed near the generator. 2.2.B.1.a.
      B. Change generator kW rating from "230 kW" to "200 kW"
      C. Add:
         2.8.B Remote E-Stop switch.

         Provide a separate E-STOP pushbutton switch. Switch to be installed inside the pump room near the Automatic Transfer Switch.

5. Section 31 23 23 Excavation and Backfill For Structures: Replace paragraph 3.2 with:
    A. Limits of shallow site over-excavation and fill requirements extend to 4 feet beyond curb line, as indicated on Sheet C-1A Note 1 in Contract Drawings.
    B. Refer to "Geotechnical Notes" on Sheet S-1B in Contract Drawings.
    C. Compact subgrade to density requirements for subsequent backfill materials.
    D. Cut out soft areas of subgrade not capable of compaction in place. Backfill with granular fill and compact to density equal to or greater than requirements for subsequent fill material.
    E. Scarify subgrade surface to depth of 6 inches.

6. Section 32 31 33 Cantilever Slide Gate & Operators: Replace content within paragraph 2.2 Gate Controls with:
    A. Slide Gate Operator and Motor
    B. Supplier: HySecurity
    C. Slide Gate Security Access – card reader & pedestal
    D. Supplier: Yamas Controls

7. Attached Section 33 11 33 Pump and Pump Motor_Addendum 2 replaces Section 33 11 33 Pump and Pump Motor in its entirety.

8. Replace Section 33 12 00 Mechanical Appurtenances in its entirety with Section 33 12 00 Mechanical Appurtenances_Addendum 2.

9. Attached Section 33 21 25 Wire Logging is added to the technical specifications.

10. Attached Section 46 36 53 Calcium Hypochlorite Tablet Chlorination System is added to the technical specifications.

E. DRAWINGS AND DETAILS

1. Attached C-1A Site Plan_Addendum 2 replaces C-1A Site Plan in its entirety.

2. Attached C-1B Site Plan_Addendum 2 replaces C-1B Site Plan Utilities in its entirety.

3. Attached C-6 Fittings and Schedules_Addendum 2 replaces C-6 Fittings and Schedules in its entirety.

4. Attached C-7 Pump Details_Addendum 2 replaces C-7 Pump Details in its entirety (oil lube reservoir was removed).

5. E103: Field locate and install the Generator E-STOP switch in between the ATS and the Panelboard H. Height of switch: +60" above floor.

6. E601:

- Diagram: Change VFD-1 from "200 HP VFD" to "150 HP VFD".
- Diagram: Motor symbol: Change well motor HP from 200 to 150.
- Diagram: Motor symbol: Change well motor FLA from 240 to 180.
- Diagram: Change circuit id for the Backup Power Generator to the ATS from (2) 430, to (1) 335.
- Keynote 3. Change from 4"C, CONDUCTORS BY UTILITY COMPANY" to "(2)4"C, CONDUCTORS BY UTILITY COMPANY".
- Keynote 9: Change VFD Conductors from "1 EA 3C-350, in 3"C (BELDEN 29534 OR APPROVED EQUAL)." to "1 EA 3C-4/0, in 2-1/2"C (BELDEN 29532 OR APPROVED EQUAL)."
- Keynote 11: Change "230 kW" to "200 kW".

7. E602: Add: From the Generator CP to the Generator E-Stop switch, a 3/4"C with 2#14 conductors.

8. E603: Diagram: Change Pump Motor from 200 HP to 150 HP.

9. E605:
   - Panelboard H: Change 350A CB for the well pump VFD to a 250A/3P circuit breaker.
   - Panelboard H: Change the Circuit ID for the well pump from "310" to "340".

10. E608:
    - Ethernet Signal Wiring Diagram: Delete the CAT 6U from the Ethernet switch to the VFD Enclosure. (Motor Temperature is not remotely monitored for the 150 HP well.)
    - Add General Note: "3. ALL ETHERNET WIRING FROM CP-1 TO FIELD DEVICES/EQUIPMENT SHALL BE INSTALLED IN 3/4"C."

F. QUESTIONS

1. The pump and discharge head sections read oil lubricated, whereas the column and shaft sections read water lubricated. Which is the intended method?
   A. Pump shall be product lubricated, see Specification Section 33 11 33 and C-7 Pump Details_Addendum 2.

2. The motor size, in table 1, indicates 250 Hp minimum. However the demand is only 120ísh. Should we quote the 250 or an appropriate 125 Hp?
   A. 150 Hp, see updated Specification Section 33 11 33 1.4A Table 1.

3. The motor section specifies RTD's. That is uncommon for smaller motors. Please confirm.
   A. RTDs are not required, see Specification Section 33 11 33.

4. The motor section has some verbiage regarding the bearing life. But it is vague and not very objective. We recommend a 60,000 hr L-10 life minimum.
   A. The bearings shall have a L-10 life 60,000 hours, see Specification Section 33 11 33 2.4.

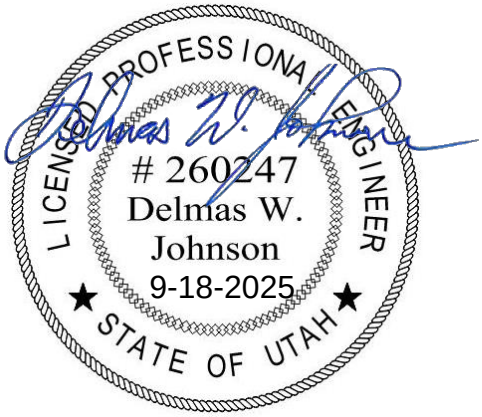
5. Doors are described as 6 panel type. We have been notified that a 6 panel door is not available in the 4'-0" x 7'-0" size. Are we to provide a flat steel door design?
   A. If 6 panel doors are not available, the City will consider an alternative.

6. Section 26 32 13.13 - States "owner approved equal" is an acceptable manufacturer for Diesel Engine Generator Sets. Can we request owner approval for a Generac diesel-engine generator set? Please advise if further documentation is necessary.
   A. A generac diesel generator meeting all technical specifications would be considered an acceptable alternative.

Bidders shall acknowledge receipt and acceptance of this Addendum No. 2 in the Bid Form or by submitting the Addendum with the bid package. Bid Forms submitted without acknowledgment or without this Addendum will be considered in nonconformance.

City of West Jordan

Appended hereto and part of Addendum No.2



END OF ADDENDUM NO. 2

WELL NUMBER 8 PUMP BUILDING
(RON WOOD PARK WELL)

PROJECT NUMBER CW 20-02

BID SUBMITTAL CHECKLIST

1.1 BID INFORMATION

A. Bidder: _____.

1.2 BIDDER'S CHECKLIST

A. To assist the Bidder in properly completing all documentation required, the following checklist is provided for the Bidder's convenience. Use of this form is optional and not required.

B. The Bidder is solely responsible for verifying compliance with bid submittal requirements, including those not specifically stated below.

C.

☐ Indicate on the Bid Form Addenda received.

☐ Sign Bid Form

☐ Attach to the Bid Form: Bid Supplement Form - Bid Schedule

☐ Attach to the Bid Form: Bid Supplement Form -List of Subcontractors

☐ Attach to the Bid Form: Bid Supplement Form -Bidder’s Licensing Statement

☐ Attach to the Bid Form: Bid Supplement Form - Equipment or Material Proposed to be furnished under the Bid.

☐ Attach to the Bid Form: Bid Supplement Form -Bidder’s General Information

B I D FORM

WELL NUMBER 8 PUMP BUILDING
(RON WOOD PARK WELL)
PROJECT NUMBER CW 20-02

BID TO: **CITY OF WEST JORDAN, UTAH**

Bidder has examined copies of all Contract Documents, including the following Addenda, receipt of which is hereby acknowledged by signing this Bid Form:

Number _____	Date _____
Number _____	Date _____
Number _____	Date _____
Number _____	Date _____
Number _____	Date _____

Bidder has familiarized itself with the nature and extent of the Contract Documents, the Work, the site, the applicable federal, state, and local laws and regulations, and all other conditions affecting cost, progress, or performance of the Work and has conducted such independent investigations as necessary.

This Bid will remain open for the period stated in the Notice Inviting Bids unless otherwise required by law. If this Bid is accepted, Bidder agrees to enter into the Contract with the City within the time and in the form set forth in the Contract Documents (as that term is defined in Article 1 of the Contract) to perform the Work as specified or indicated in said Contract Documents and will furnish the insurance certificates, Payment Bond, Performance Bond, and Permits required therein. Bidder accepts all of the terms and conditions of the Contract Documents, including, without limitation, those in the Notice Inviting Bids and Instructions to Bidders dealing with the disposition of the Bid Security. In conformance with current statutory requirements of the State of Utah, the Bidder shall be insured against liability for worker's compensation before commencing the performance of the work of this contract.

Bidder agrees and warrants the accuracy of the information contained in the documents accompanying this Bid Form, including all Bid Schedule(s), List of Subcontractors, Equipment or Material Proposed, and Bidder's General Information. Bidder further warrants that it is able to complete the Work required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept as full payment the Contract Price based on the Lump Sum or Unit Bid Price(s) named in the applicable Bid Schedule(s).

Dated: _____ Bidder: _____

By: _____
(Signature)

Title: _____

BID SCHEDULE
Schedule of Prices for Construction of

WELL NUMBER 8 PUMP BUILDING
(RON WOOD PARK WELL)

PROJECT NUMBER CW 20-02

In West Jordan, Utah

A. The bid includes all materials, labor, and incidental items associated with the proposed improvements. Refer to Section 01 29 00, Measurement and Payment for additional information.

BASE BID

Item No.	Specification Reference Number Classification of Unit Price Work	Quantity Unit	Unit Price	Amount
1	Mobilization	1 Lump Sum	$	$
2	Construction surveying and SWPPP	1 Lump Sum	$	$
3	Pump house structure, generator screening walls and concrete pad	1 Lump Sum	$	$
4	Shallow over-excavation (first 4 feet), import fill, compaction and testing	1 Lump Sum	$	$
5	Deep over-excavation (additional 8 feet), import fill, compaction and testing	1 Lump Sum	$	$
6	Furnish and install pump, pump column and shaft and motor, complete	1 Lump Sum	$	$
7	Furnish and install pump station piping and valving, complete	1 Lump Sum	$	$
8	Furnish and install tablet chlorination system, complete	1 Lump Sum	$	$
9	Furnish and install pipeline (discharge, floor drain sewer, pump-to-waste, and site drainage) and pump-to-waste discharge structure, complete	1 Lump Sum	$	$
10	Landscaping site improvements, complete	1 Lump Sum	$	$
11	Furnish and install site fencing and access gate, complete	1 Lump Sum	$	$
12	Furnish and install finished asphalt pavement and curb, complete	1 Lump Sum	$	$
13	Furnish and install electric power supply, electrical systems, instrumentation, control panels, generator and transfer switch, complete	1 Lump Sum	$	$

Item No.	Specification Reference Number Classification of Unit Price Work	Quantity Unit	Unit Price	Amount
14	Furnish and install HVAC system, complete	1 Lump Sum	$	$
15	Testing and Startup	1 Lump Sum	$	$
16	Brush and Bail 20-inch Casing	1 Lump Sum	$	$
17	Video Well Log	1 Lump Sum	$	$

Total work; Base Bid = $_____

END DOCUMENT

CONTRACT

THIS CONTRACT is made by and between the City of West Jordan, a legal entity organized and existing in Salt Lake County ("CITY") and xxxx ("CONTRACTOR"). CITY and CONTRACTOR are sometimes collectively referred to herein as "Parties" and individually as "Party."

The Parties, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - THE CONTRACT DOCUMENTS

The Contract Documents consist of: Notice Inviting Bids, Instructions to Bidders, Bidder's Licensing Statement, the accepted Bid and Bid Schedule(s), List of Subcontractors, Equipment or Material Proposed, Bidder's General Information, this Contract, Performance Bond, Payment Bond, Notice of Award, Notice to Proceed, Notice of Completion, General Conditions of the Contract, Supplementary General Conditions of the Contract, Technical Specifications, Standard Specifications, Supplemental Specifications, Special Provisions, Drawings listed in The Schedule of Drawings in the Supplementary General Conditions or on the Cover Sheet of the Drawings, Addenda numbers xx to xx inclusive, and all Change Orders, and Work Directive Changes which may be delivered or issued after the Effective Date of the Contract and are not attached hereto, all of which are incorporated herein by reference.

ARTICLE 2 - THE WORK

The CONTRACTOR shall complete the Work as specified or indicated under the Bid Schedule(s) of the CITY's Contract Documents entitled:

WELL NUMBER 8 PUMP BUILDING
(RON WOOD PARK WELL)
PROJECT NUMBER CW 20-02

The Work of this Contract generally includes, ("Work")

ARTICLE 3 - COMMENCEMENT AND COMPLETION

The Work shall commence on the date specified in the CITY's Notice to Proceed and shall be substantially completed within 420 calendar days after the commencement date stated in the Notice to Proceed.

The Parties recognize that time is of the essence and that CITY will suffer injury that may be difficult or impossible to quantify in monetary damages. If the Work is not completed within the time specified above, CONTRACTOR shall pay CITY liquidated damages according to the chart below:

Original Contract Amount		**Daily Charge**
From More than	**To and Including**	
$0	$100,000	$560
$100,000	$500,000	$930
$500,000	$1,000,000	$1,200
$1,000,000	$5,000,000	$2,130
$5,000,000	$10,000,000	$2,430

Additional liquidated damages for specific bid items may be set forth in the Measurement and Payment sections.

ARTICLE 4 - CONTRACT PRICE

The CITY shall pay the CONTRACTOR for the completion of the Work in the total amount of **$xxxx** in accordance with the Contract Documents and the CONTRACTOR's Bid and Bid Schedule(s). The Parties understand and agree that this amount represents full compensation for the Work. CONTRACTOR accepts all risk, whether known or unknown, anticipated or unanticipated, of the increased cost of performance, including but not limited to increased materials cost, regardless of amount.

ARTICLE 5 - PAYMENT PROCEDURES

The CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General

Conditions and the Supplementary General Conditions. Applications for Payment will be processed by the Engineer, Architect, or CITY as provided in the General Conditions and shall include the CITY's purchase order number.

ARTICLE 6 - NOTICES
Whenever any provision of the Contract Documents requires written notice to CONTRACTOR, it shall be deemed to have been validly given if delivered to the CONTRACTOR's Project Manager in person or via email or registered or certified mail, postage prepaid, to the CONTRACTOR's last known business address.

Whenever any provision of the Contract Documents requires written notice to CITY, it shall be deemed to have been validly given if delivered in person or by registered or certified mail, postage prepaid, to the City Recorder at 8000 S. Redwood Rd., West Jordan, Utah 84088, with a copy to the City Attorney.

ARTICLE 7 - MISCELLANEOUS
Terms used in this Contract which are defined in Article 1 of the General Conditions and Supplementary General Conditions will have the meanings indicated therein. No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are 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 Documents.

The PARTIES each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, contracts, and obligations contained in the Contract Documents.

ARTICLE 8 - REPRESENTATION REGARDING ETHICAL STANDARDS FOR CITY OFFICERS AND EMPLOYEES AND FORMER CITY OFFICERS AND EMPLOYEES: The bidder, offeror, or contractor represents that they have not: (1) provided an illegal gift or payoff to a city officer or former city officer or employee, or his or her relative or business entity; (2) retained any person to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, other than as exempted in the City's Conflict of Interest ordinance; or (3) knowingly influenced (and hereby promises that it will not knowingly influence) a city officer or employee or former city officer or employee to breach any of the ethical standards set forth in the City's Conflict of Interest ordinance, Title1, Chapter 11, Section 15 of the City of West Jordan Municipal Code.

IN WITNESS WHEREOF, the CITY and the CONTRACTOR have caused this Contract to be executed the day and year first above written.

EXECUTION OF CONTRACT
In concurrence and witness whereof, this Contract has been executed by the parties effective on the date the last party signs this Contract.

CITY OF WEST JORDAN, UTAH
By:

_____
Mayor

Attest:

_____
City Recorder

Approved as to Legal Form:

_____
City Attorney

CONTRACTOR

_____ _____
Signature Date

_____
Name and Title

SECTION 01 22 00
MEASUREMENT AND PAYMENT

PART 1 GENERAL

A. All work completed under this contract shall be in accordance with the Drawings and Specifications and will be measured by ENGINEER/OWNER. The quantities appearing on the Bid Schedule are approximate only and are prepared for the comparison of bids. Payment to 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 in accordance with the General Conditions.

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, 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. 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 budgeted money available.

1.2 BASE BID SCHEDULE

A. BID ITEM NO. 1 - "MOBILIZATION"

1. **GENERAL.** This bid item is provided to cover CONTRACTOR's cost for general and miscellaneous responsibilities and operations not normally attributed to any other single bid item within this schedule. This shall include, but is not limited to, work described or enumerated in Section 01 71 13 - Mobilization.

2. **METHOD OF MEASUREMENT.** Mobilization shall not be measured, but shall be paid for on a lump sum basis for the completion of the work as required in Section 01 71 13 - Mobilization.

3. **BASIS OF PAYMENT.** Payment will be made at the contract lump sum bid price. Payments will be made in accordance with the following schedule:

    a. When 10% of the original contract amount is earned, 25% of the amount bid for mobilization will be paid.
    b. When 25% of the original contract amount is earned, an additional 25% for a total of 50% of the amount bid for mobilization will be paid.
    c. When 50% of the original contract amount is earned, an additional 25% for a total of 75% of the amount bid for mobilization will be paid.

d. When 75% of the original contract amount is earned, an additional 25% for a total of 100% of the amount bid for mobilization will be paid.

B. **BID ITEM NO. 2 - "CONSTRUCTION SURVEYING AND SWPPP"**

1. **GENERAL** This item is provided to cover the CONTRACTOR's cost for general and miscellaneous responsibilities and operations associated with Construction Surveying and submission of a completed SWPPP. Construction Surveying shall be performed by a registered professional land surveyor.

2. **METHOD OF MEASUREMENT** Construction Surveying and SWPPP shall be measured based on the percentage of work completed for the project according to the amount defined in the Bid Schedule.

3. **BASIS OF PAYMENT** Payment shall be at the contract price bid on a lump sum basis for performing construction surveying complete and submission of a completed SWPPP. Payment shall be considered full compensation for all labor, equipment, materials and incidentals required to complete this item. Payments will be made in accordance with the following schedule:
   a. When 10% of the original contract amount is earned, 75% of the amount bid for construction surveying will be paid.
   b. When 75% of the original contract amount is earned, an additional 25% for a total of 100% of the amount bid for construction surveying will be paid.

C. **BID ITEM NO. 3 - "PUMP HOUSE STRUCTURE, GENERATOR SCREENING WALLS AND CONCRETE PAD"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for the construction of pump house structure, generator screening walls and concrete pad complete as one item.

2. **BASIS OF PAYMENT.** Payment for "Pump House Structure, Generator Screening Walls and Concrete Pad" shall not be measured but shall be made at the contract lump sum bid price for completion of all items to construct the well pump house structure, generator screening walls and concrete pad as shown on the Contract Drawings and specified herein. Payment shall include furnishing all labor, material and equipment including, but not limited to, floor slab fill, and floor slab fill (upper 4-inches), backfill and compaction, installing all reinforced concrete, concrete masonry unit block, roof trusses and sheathing, standing seam metal roofing, metal fascia and soffits, skylights, raingutter and downspouts, doors, painting and coating, floor drains and piping, concrete equipment pads; concrete generator pad including footings; insulation, copper water piping with hangers and hose bibbs, and miscellaneous items to complete the structure of the pump station.

D. **BID ITEM NO. 4 - "SHALLOW OVER-EXCAVATION (FIRST 4 FEET), IMPORT FILL, COMPACTION AND TESTING"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for the over-excavation of the first four feet at the project site within the limits indicated on the Contract Drawings, placing imported structural fill, compaction, and subsequent testing, complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum bid price for the shallow over-excavation of unsuitable soils, furnishing, placement, and compaction of imported fill as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to all labor, materials, and equipment for the excavation of the first four feet at the project site within the limits indicated on the Contract Drawings, furnishing and placement of imported structural fill in lifts according to specifications, compaction, removal and disposal of excess excavated material in location determined by the City, and subsequent testing complete. Payment shall be considered full compensation for all labor, equipment, materials and incidentals required to complete this item.

E. **BID ITEM NO. 5 - "DEEP OVER-EXCAVATION (ADDITIONAL 8 FEET), IMPORT FILL, COMPACTION AND TESTING"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for the over-excavation of an additional eight feet of unsuitable soils at the project site within the limits indicated on the Contract Drawings, placing imported structural fill, compaction, and subsequent testing, complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum bid price for the deep over-excavation of unsuitable soils, furnishing, placement, and compaction of imported fill as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to all labor, materials, and equipment for the excavation of an additional eight feet at the project site within the limits indicated on the Contract Drawings, furnishing and placement of imported structural fill in lifts according to specifications, compaction, removal and disposal of excess excavated material in location determined by the City, and subsequent testing complete. Payment shall be considered full compensation for all labor, equipment, materials and incidentals required to complete this item.

F. **BID ITEM NO. 6 - "FURNISH AND INSTALL PUMP, PUMP COLUMN AND SHAFT, AND MOTOR, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for installation of the pump, pump column and shaft and motor complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum bid price for furnishing and installing the pumps as shown on the Contract Drawings and specified herein. Payment for the one (1) well pump shall include, but not be limited to all labor, materials, and equipment for furnishing and installing pump discharge head, extending existing well casing, isolation sleeves and washers; pump bowl assembly, shafting, columns, motor, PVC sounder tubes, and all other pump related items not paid elsewhere for a complete and operable well pump and motor. Electrical gear (aside from pump motor) and connections paid elsewhere. Prior to payment, the pump must be in proper operating condition.

G. **BID ITEM NO. 7 - "FURNISH AND INSTALL PUMP STATION PIPING AND VALVING, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for furnishing and installing the pump station piping starting at the pump discharge head to the first fittings outside the pump station footprint according to the amount defined in the Bid Schedule and as completed by CONTRACTOR.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum bid price for furnishing, installing, and testing the pump station piping system as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to, all labor, materials, and equipment for furnishing and installation of all piping, valves, flow meter, pressure relief valve, pump control valve, and fittings as shown on the Contract Drawings; all items referenced in the valve and fitting schedule on Sheet C-6 of the Contract Drawings, pipe supports, excavation, polyethylene wrap, concrete encasement, air valves, pressure gauge and pressure switch piping and fittings, pipe coating, flange isolation kits, joint restraints, disinfection and testing, and all other appurtenances and related items not paid elsewhere for a complete and operable piping system.

H. **BID ITEM NO. 8 - "FURNISH AND INSTALL TABLET CHLORINATION SYSTEM, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for the installation of pump station piping, valving, and chlorination system complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract unit lump sum bid price for completion of all pipes, valves, fittings, and equipment necessary to construct a safe and fully functional tablet chlorination system as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to, all labor, materials, and equipment for furnishing and installing the tablet chlorination skids, water circulation pump; piping and tubing; necessary valves and fittings; chlorine tablets and injector; rotameter and other dosing and monitoring equipment; injection quill and saddle; system testing and training, and all other appurtenances and other related items not paid elsewhere for a complete and operable tablet chlorination system.

I. **BID ITEM NO. 9 - "FURNISH AND INSTALL PIPELINE (DISCHARGE, FLOOR DRAIN SEWER, PUMP-TO-WASTE, AND SITE DRAINAGE) AND PUMP-TO-WASTE DISCHARGE STRUCTURE, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for installation of discharge, floor drain sewer, pump-to-waste and site drainage pipelines, and construction of pump-to-waste discharge structure complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract unit lump sum bid price for completion of all discharge, floor drain sewer, pump-to-waste, and site drainage piping and structures as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to, labor, materials, and equipment for furnishing and installing the 8-inch well discharge diameter DIP pipe, valves, fittings and hot tap saddle, flushing, disinfection; 4-inch diameter SDR35 PVC sewer pipe, concrete sewer manholes; 15-inch diameter SDR35 PVC storm drain pipe, concrete

pump-to-waste structure, storm drain inlet grate and precast concrete boxes or manholes; excavation, removal and disposal of excess excavation materials, sand bedding, imported backfill, compaction; installation of thrust blocks as necessary and as shown on the Contract Drawings; pipeline testing according to specifications herein and all other appurtenances to complete this portion of the Work as described and as shown on the Contract Drawings

J. **BID ITEM NO. 10 - "LANDSCAPING SITE IMPROVEMENTS, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for construction of the landscaping site improvements complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum bid price, including all systems required in the Contract Drawings and Specifications. Payment shall be considered complete compensation for all work performed. Payment shall include all labor, equipment, and materials construction of the landscaping and restoration of existing vegetation and ground cover, including but not limited to furnishing piping, valves, fittings, irrigation boxes, control timers; planting trees, weed barrier, rock or wood mulch, fertilizer, irrigation repairs, and all other incidentals not specifically paid for in other bid items but which are shown or otherwise required to complete the installation as herein described and as shown on the Contract Drawings and Specifications.

K. **BID ITEM NO. 11 - "FURNISH AND INSTALL SITE FENCING AND ACCESS GATE, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for furnishing and installing of the site fencing and access gate complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be at the contract price bid on a lump sum basis for furnish and installation of site fencing and access gate complete. Payment shall be considered full compensation including, but not limited to, all labor, material, and equipment for furnishing and installing the site fencing and access gate as shown on the Contract Drawings, including excavation, backfill, and compaction; steel reinforcement, concrete, grout, and mortar; wrought iron fencing; access gate and keypad, gate motor, hinges, and all other appurtenances and other items required as shown on the Contract Drawings.

L. **BID ITEM NO. 12 - "FURNISH AND INSTALL FINISHED ASPHALT PAVEMENT AND CURB, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for construction of finished asphalt pavement and curb complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be considered full compensation for all work completed under this bid item and shall be paid for on a lump sum basis. Work shall include all labor, equipment, and materials, including but not limited to final grading, furnishing and installing the roadbase (UBC) and asphalt, compaction, and all other

operations and materials required to complete the asphalt pavement around the site as herein described and as shown on the Contract Drawings.

M. **BID ITEM NO. 13 - "FURNISH AND INSTALL ELECTRIC POWER SUPPLY, ELECTRICAL SYSTEMS, INSTRUMENTATION, CONTROL PANELS, GENERATOR AND TRANSFER SWITCH, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for connecting to the existing electric power supply, installation of electrical systems, instrumentation, control panels, backup generator and transfer switch complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract unit lump sum bid price for completion of all electrical work as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to, all labor, materials, and equipment for furnishing and installing all electrical equipment at the well pump house, one (1) variable frequency drive, panelboards, transformer, lighting, service outlets, pressure switches, pressure transducers, intrusion switches, flood switch, buried conduits, electrical service connection, wiring for equipment controls and signals, installation of APCO supplied PLC, termination of conductors and wiring within APCO supplied PLC, grounding, antenna, pump motor terminations (motor is furnished and installed under Bid Item 6), lightning protection system, connections to water quality monitoring equipment, chlorine dosing equipment, HVAC, generator with weather and sound enclosure, exhaust silencer, automatic transfer switch, stainless steel epoxy anchor bolts, mounting to concrete pad, buried conduits and wiring, connections, testing, and all other related items as shown on the Contract Drawings not paid elsewhere and all other items as shown on the Contract Drawings required for a complete and operable electrical system.

N. **BID ITEM NO. 14 - "FURNISH AND INSTALL HVAC SYSTEM, COMPLETE"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for furnishing and installation of the HVAC system complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum bid price for HVAC work as shown on the Contract Drawings and specified herein. Payment shall include, but not be limited to all labor, materials, and equipment for furnishing and installing all HVAC equipment, conduits, wiring, electric unit heaters, ductwork, exhaust fans, supports, and all other related items as shown on the Contract Drawings not paid elsewhere.

O. **BID ITEM NO. 15 - "TESTING AND STARTUP"**

1. **METHOD OF MEASUREMENT.** This Bid Item shall not be measured but shall be paid for on a lump sum basis for testing and startup services.

2. **BASIS OF PAYMENT.** Payment shall be made at the contract lump sum price for all work required for testing the completed well pump station and the components therein. Payment shall include, but not be limited to, all labor, equipment, and materials required for all work performed. Testing shall include, but not be limited to, verifying all components are working in accordance with the Contract Drawings and in the

Specifications, verifying all subsystems are in working condition, verifying that pump motors are wired in the correct direction, verifying all circuits and panels are wired correctly, and all other operations and materials required to confirm and verify the well pump station and related systems are functioning as designed and as shown on the Contract Drawings and specified herein.

P. **BID ITEMS 16 – "BRUSH AND BAIL 20-INCH CASING"**

1. **METHOD OF MEASUREMENT.** Measurement shall be based on performing brushing and bailing of the well as one item.

2. **BASIS OF PAYMENT.** Payment shall be at the contract price bid on a lump sum basis for performing brushing and bailing procedures. Payment shall be considered full compensation for all labor, equipment, materials, and incidentals required to complete this item.

Q. **BID ITEM 17 - "VIDEO WELL LOG"**

1. **METHOD OF MEASUREMENT.** Measurement shall be based on performing and providing the video well log complete as one item.

2. **BASIS OF PAYMENT.** Payment shall be at the contract price bid on a lump sum basis for performing and providing the video well log complete, including providing a copy of the video log to the OWNER in DVD format at no additional cost. Payment shall be considered full compensation for all labor, equipment, materials and incidentals required to complete this item.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)s

- END OF SECTION -

SECTION 08 10 00
DOORS AND FRAMES

PART 1 GENERAL

1.1 DESCRIPTION

A. This Section covers all the work necessary to furnish and install the new doors, frames, and hardware, complete and operable.

B. All doors and their pressed steel frames shall be steel, insulated, and the type and size as indicated on the Door Schedule on the Drawings.

1.2 RELATED WORK

A. Related work in other Sections includes but is not limited to:

1. Section 01 33 00 Submittal Procedures
2. Section 09 90 00 Painting and Finishes

1.3 REFERENCES

A. Work covered by this Specification shall meet or exceed the provisions of the latest editions of the following Codes and Standards in effect at the time of award of the Contract. The publications are referred to in the text by basic designation only.

B. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

1. ANSI A 115.IG Installation Guide for Doors and Hardware
2. ANSI A 156.6 Standard for Architectural Door Trim
3. ANSI A 156.16 Standard for Auxiliary Hardware
4. ANSI A 250.8 SDI-100 Recommended Specifications for Standard Steel Doors and Frames
5. ANSI A 250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
6. ANSI A 250.11 Recommended Erection Instructions for Steel Frames

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1. ASTM A 36 Standard Specification for Carbon Structural Steel
2. ASTM A 108 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
3. ASTM A 123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
4. ASTM A 229 Standard Specification for Steel Wire, Quenched and Tempered for Mechanical Springs
5. ASTM A 653 Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process
6. ASTM A 1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

7. ASTM A 1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
8. ASTM C 177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
9. ASTM D 256 Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
10. ASTM D 635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
11. ASTM D 790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
12. ASTM D 792 Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
13. ASTM D 882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting
14. ASTM D 1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics
15. ASTM D 2583 Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
16. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
17. ASTM E 330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

D. AMERICAN WELDING SOCIETY (AWS)

1. AWS D1.1 Structural Welding - Steel
2. AWS D1.3 Structural Welding Code – Sheet Steel

1.4 SUBMITTALS

A. Provide Submittals in accordance with Section 01 33 00 – Submittal Procedures.

B. Manufacturer's catalog data and preprinted installation instructions of doors.

C. A schedule showing the location of each door shall be included with the drawings. Submittal drawings shall include elevations of each door type, details and method of anchorage, details of construction, method of assembling sections, location and installation of hardware, shape and thickness of materials, details of joints and connections.

D. Manufacturer’s certificates that certify products meet or exceed the specified requirements.

E. Warranty: Provide documentation of the manufacturer’s standard written one (1) year warranty.

1.5 DELIVERY AND STORAGE

A. Doors shall be delivered to the job site wrapped in a protective covering with the brands and names clearly marked thereon. Doors shall be stored in a dry location that is adequately ventilated and free from dust or water, and in a manner that permits easy access for inspection and handling. Doors shall be handled carefully to prevent damage to the faces, edges, and ends. Damaged items that cannot be restored to like-new condition shall be replaced.

1.6 MEASUREMENT AND PAYMENT

A. There shall be no separate measurement and payment for doors, frames, and hardware. Full compensation for all doors, frames, and hardware shall be considered as included in the contract unit or lump sum bid prices for the various items of the Contract to which doors relate.

PART 2 PRODUCTS

2.1 STEEL DOORS

A. Steel doors and frames shall be of hollow metal construction and shall be full flush design with no visible seams. Interior and Exterior door face sheets shall be hot-dip galvanized according to the requirements of ASTM A 653. Manufacturer's shall be **Republic Doors and Frames, Steelcraft, Ceco Door Products**, or approved equal. Doors shall conform to ANSI A 250.8 and to the following requirements:

1. Hollow metal door, 1 3/4 inches thick flush type, constructed of two sheets of not less than stretcher leveled, 16-gauge steel sheets formed and welded for flush pan assembly, with internal 20-gauge vertical reinforcing channels spaced not over 8 inches on centers the full height of the door. There shall be no visible joints on the face of the doors. Reinforcing channels shall be uniformly spot welded to face plates at top and bottom of all doors. Filler channels shall be provided at the top and bottom of doors to provide a flush closure. The top of exterior doors shall be provided with flush, water- and weather-tight top enclosures.
2. All interior void spaces shall be completely filled with EPS foam or polyurethane.
3. Concealed sheet or bar steel reinforcement shall be provided for mortise type hardware. Reinforcing shall not be less than the following: 9-gauge for butts, 12-gauge for locksets and 14-gauge for surface applied hardware. Reinforcing shall be drilled and tapped to template requirements. Concealed reinforcing shall be provided for closures. Door bottom weather stripping shall be included to match thresholds.
4. Door frames shall be pressed steel constructed of not less than 16-gauge steel and shall be of the shape indicated on the plans and as required to fit the various wall constructions. Frames shall be of welded unit construction assembled and welded in the shop. Welding shall be to a hairline joint with all exposed beads ground smooth.
5. Concealed reinforcing of the frames for the mortise hardware shall be not less than the following: 3/16 inch for butts, 12- gauge for lock strike, 14-gauge for surface applied items and 18-gauge for plaster guards over mortised hardware reinforcement. Frames shall be mortised drilled, and tapped to template requirements. Lock reinforcing units shall be supplied by finishing hardware supplier. Frames shall be anchored as shown in the drawings.
6. Hinges shall be heavy duty ball bearing hinges with non-removable pins.

7. Pull plates shall be chrome plated or stainless steel and mounted on interior and exterior sides of all doors.
8. All double doors are to be supplied with a “Z” astragal of 14-gage steel for 1-3/4-inch doors and 16-gage for 1-3/8-inch doors.
9. Hardware including locksets and hinges shall be stainless steel.

2.2 DOOR HARDWARE

A. Trim material shall be stainless steel, unless noted otherwise.

B. Pull Plates: 8” CTC pull, 4” x 16” plate, stainless steel, No. 110 x 70C by **Rockwood Mfg. Co**., or approved equal, conforming to ANSI A 156.6.

C. Hinges: satin stainless steel, 5 knuckles minimum, non-rising pin for interior doors and non-removable pin for exterior doors, number of hinges per door manufacturer’s recommendation (minimum of 3 hinges per door). Where necessary to keep door leaf clear of walls, casings, jambs or reveals in door opening, wide throw hinges of an approved type shall be furnished. Finish shall be stainless steel satin (32D or 630). Manufacturer shall be **Mckinney T4A3386, Hager, Stanley Works FBB199 (32D),** or approved equal.

D. Cylinder Lock Set: **Best Access Systems**, Lockset 47H-7-AB-15-J-630-SH-S6-VT for exterior doors and 45H-7-N-15-M-630 for interior doors. Locks must be compatible with Owners existing keys. Contractor shall provide lock sets and keys that will match Owner’s requirements.

E. Lever Extension Flush Bolt, Upper, **Rockwood No. 555**, or approved equal, cadmium plated finish (inactive leaf only), conforming to ANSI A 156.16.

F. Lever Extension Flush Bolt, Lower, **Rockwood No. 555**, or approved equal, cadmium plated finish (inactive leaf only), conforming to ANSI A 156.16.

G. Threshold: **#277AS by Pemko Corporation**, or approved equal, raised interior, extruded aluminum threshold with neoprene seal.

H. Drip Cap: Provide drip cap on all exterior doors. Drip cap shall be clear anodized aluminum, **Pemko 346C**, or approved equal.

I. Door Closers: Door closers shall be full rack and pinion, cast iron, with adjustable regulators for closing and latching speed, back check and spring power. Closers shall be mounted for 180 degrees of swing whenever possible. All closers shall be LCN Model 4040XP with 4041-3071 DEL cylinder with extra duty hold open arm. Mounting plates shall be supplied as necessary. All door closers attached to mineral core or particle filled doors shall be installed with hex bolts. Cover shall be metal 4040XP-72MC with 689 Aluminum finish.

J. Lock Strikes: Strikes shall have extended curved lips where required to protect trim from being marred by latch bolt. Strike lips shall not protrude more than 1/8-inch beyond door frame trim. Wrought box strikes shall be furnished on all locks, latches and deadlocks.

K. Door Stop: Solid cast brass, DuraFlex bumper, **Rockwood #445**, or approved equal (Inactive leaf only)

L. Non-Mortise Door Edge with Astragal: 0.06” thick stainless steel, **Rockwood HD306B-AST**, or approved equal (double doors only)

M. Kick Plates: Unless otherwise indicated, kick plates shall be provided and shall be satin stainless 18-8, 18 gage, **Rockwood No. K1050F**, or approved equal.

N. Weatherstripping and Seals: silicone gasketing, **Pemko S88D**, or approved equal.

O. Security Card Access: Yamas Controls to furnish and install security card access hardware

2.3 ACCESS DOORS AND FRAMES

A. Fabricate doors and frames as shown on the drawings and in accordance with best shop practices. Frames shall be rigid, neat in appearance and free from defects. Field measurements shall be taken as required for coordination with adjoining work.

B. Form exposed surfaces free from warp, wave and buckle, with all corners square, unless otherwise shown. Set each member in proper alignment and relationship to other members with all surfaces straight and in a true plane.

C. Reinforce members and joints with plates, tubes or angles for rigidity and strength.

D. Doors and frames shall be mortised and reinforced for hardware in accordance with the hardware manufacturer’s instructions and templates. The reinforcing shall be designed to receive hinges, locks, strikes, closures, etc.

E. Mortar guard boxes shall be provided for hardware cutouts in frames.

F. Furnish at least three (3) metal anchors or polymer spacers in each jamb of frames up to 84" high and one (1) additional anchor for each 24" in height above 84", in shapes, sizes and spacing shown or required for anchorage into adjoining wall construction. Fabricate joint anchor of stainless steel.

G. Terminate bottom of frames at the indicated finished floor level.

H. Provide clearance for doors of 1/8" at jambs and heads; 1/4" clearance above threshold.

I. Where glazing is required, flush integral stops on one side and screw-on stops on the opposite side shall be provided.

2.4 FINISH

A. Surfaces shall be provided with a shop-primed galvanized finish. Prior to receiving primer, all surfaces shall be cleaned thoroughly and phosphate-treated to assure maximum paint adherence. Primer shall be a metallic oxide or synthetic resin primer of the manufacturer's standard type and shall be applied by dipping or spraying in accordance with ANSI A 250.10.

B. Field painting of doors and frames shall be in accordance with Section 09 90 00 – Painting and Finishes. Finish coat shall be compatible with the shop applied primer coating.

2.5 ACCESSORIES

A. Locking: Provide a master keyable cylinder operable from both sides of door knob, options for all types of operation. Cylinder shall be **Best Lock Double Barrel** cores.

PART 3 EXECUTION

3.1 INSTALLATION

A. Doors shall be installed in accordance with approved detail drawings and manufacturer's instructions and in accordance with ANSI A 115IG. Anchors and inserts for guides, brackets, hardware, and other accessories shall be accurately located. Upon completion, doors shall be weather tight and shall be free from warp, twist, or distortion. Doors shall be lubricated, properly adjusted, and demonstrated to operate freely.

B. Access Door Frame Installation

1. Place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged. Frame must not be drilled for brace supports as finish may be damaged. Install frames in accordance with ANSI A 250.11.
2. Locate three (3) wall anchors per jamb at hinge and strike levels. Frames may be grouted full of mortar at jambs and anchors shall be built into the joints as walls are laid up. A continuous bead of silicone sealant is to be applied between the head and jamb at the miter joint.

C. Adjust doors for free swing without binding. Adjust hinge sets, locksets, and other hardware. Lubricate using a suitable lubricant compatible with the door and frame coatings.

D. Install work of this Section in strict accordance with approved shop drawings and manufacturer’s recommended installation instructions. Where installations require field welding, all work must be performed by certified welders in accordance with AWS D1.1/D1.3.

E. Upon installation, secure the services of a qualified representative of the manufacturer to visit the jobsite and inspect the complete installation of the door and frame assemblies, test all components thru a minimum of ten (10) cycles of operation and direct installer in correcting any non-conforming items found.

F. Remove temporary coverings. Repair or replace damaged installed products. Clean installed products in accordance with the manufacturer’s instructions before acceptance by OWNER.

G. Clearances at edge of doors:

1. Between door and frame at head and jambs: 1/8 inch.
2. At meeting edges pairs of doors and at mullions: 1/8 inch.
3. At transom panels, without transom bars: 1/8 inch.
4. At sills without thresholds: 5/8-inch maximum above finish floor.
5. At sills with thresholds: 1/8-inch above threshold.

3.2 HARDWARE SCHEDULE

A. The hardware schedule is arranged for convenience of locating hardware and does not preclude in any way the requirements that all necessary hardware shall be furnished and properly installed. Hardware not specifically called out shall be similar to that required for similar uses.

B. Hardware equal in quality and utility will be accepted provided it conforms in operation, quality, weight, size, workmanship, and finish to the products hereinafter described. All component parts of locksets shall be the product of one manufacturer.

Hardware Set 1 (Door 101A)

Each to Receive:

Quantity	Item	Model No.	Finish	Manufacturer
3 each*	Hinge	T4A3386 4.5”x4.5”	32D	McKinney
1 each	Lockset	47H-7-AB-15-J-630-SH-S6-VT	630	Best Access Systems
1 each	Closer	4040XP	689	LCN
1 each	Kickplate	K1050F	630	Rockwood
1 each	Wall Stop	409	32D	Rockwood
3 each	Silencer	608	Gray	Rockwood
1 each	Threshold	277AS	Alum	Pemko
1 each	Drip Cap	346C	Alum	Pemko
1 set	Perimeter Seal	S88D	Alum	Pemko

*Five Knuckle, Stainless Steel, Non-removal Pin Hinges (size and quantity by door manufacturer)

Hardware Set 2 (Door 101B)

Each to Receive:
Five Knuckle, Stainless Steel, Non-removal Pin Hinges (size and quantity by door manufacturer)

Quantity	Item	Model No.	Finish	Manufacturer
1 each*	Lockset	47H-7-AB-15J-M-630-SH-S6-VT	630	Best Access Systems
3 each***	Hinge	T4A3386-NRP 4.5”x4.5”	32D	McKinney
1 each	Closer	4040XP	689	LCN
1 each	Kickplate	K1050F	630	Rockwood
1 each	Astragal	HD306B-AST	630	Rockwood
1 each**	Flush Bolt, upper	555	626	Rockwood
1 each**	Flush Bolt, lower	555	626	Rockwood
1 each	Threshold	277AS	Alum	Pemko
1 each	Drip Cap	346C	Alum	Pemko
1 set	Perimeter Seal	S88D	Alum	Pemko

* Deadbolt required on Active Leaf only
** Inactive Leaf Only
***Five Knuckle, Stainless Steel, Non-removal Pin Hinges (size and quantity by door manufacturer)

- END OF SECTION -

SECTION 31 23 23
EXCAVATION AND BACKFILL FOR STRUCTURES

PART 1 GENERAL

1.1 DESCRIPTION

A. This section covers excavating, backfilling, and compacting of disturbed areas for structures and roadways as directed by ENGINEER.

1.2 RELATED WORK

A. Related work specified in other sections:

1. Section 01 33 00 Submittal Procedures
2. Section 01 45 00 Quality Control and Materials Testing
3. Section 01 45 23 Testing Agency Services
4. Section 01 50 00 Temporary Construction Utilities and Environmental Controls
5. Section 31 11 00 Clearing, Grubbing and Stripping
6. Section 31 23 15 Excavation and Backfill for Buried Pipelines
7. Section 31 23 19 Dewatering

1.3 REFERENCES

A. The latest edition of the following publications form a part of this specification to the extent referred. The publications are referred to in the text by basic designation only.

B. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

1. M 145 Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
2. T 27 Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
3. T 88 Standard Method of Test for Particle Size Analysis of Soils
4. T 180 Standard Method of Test for Moisture Density Relations of Soils Using a 10 lb. (4.54 kg) Rammer and an 18 in (457 mm) Drop
5. T 191 Standard Method of Test for Density of Soil In Place by the Sand Cone Method
6. T 310 Standard Specification for In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1. D 422 Standard Test Method for Particle Size Analysis of Soils
2. D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft3)
3. D 1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone method
4. D 1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft3)
5. D 2487 Standard Practice for Classification of Soils for Engineering Purposes

(Unified Soil Classification System)

6. D 6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

D. The latest Edition of the Utah Department of Transportation Standard Specification for Road and Bridge Construction.

E. The latest Edition of the American Public Works Association (APWA) and Associated General Contractors of America Standard Plans and Standard Specifications.

1.4 SUBMITTALS

A. The following shall be submitted in accordance with Section 01 33 00 Submittal Procedures:

1. Submit gradations and proctors for structural fill materials and backfill materials.

PART 2 PRODUCTS

2.1 WALL BACKFILL MATERIAL

A. Wall backfill material shall consist of native or import fill material meeting soils classifications A-1, A-2 or A-3 of AASHTO M 145, with a maximum particle size no greater than 6 inches in any dimension and shall be capable of meeting the compaction requirements.

1. Wall backfill material shall be free from frozen lumps, rocks larger than 6 inches in the largest dimension, roots, trash, lumber and organic material.

2.2 STRUCTURAL FILL

A. Structural fill material, if required, shall meet the following requirements.

1. Material shall be non-expansive granular soil with less than 35 percent passing the No. 200 sieve, with a liquid limit less than 30, and free from rocks larger than 4 inches in the largest dimension, frozen lumps, roots, trash, lumber and organic material. The natural soils may be used as structural fill where it meets the above stated criteria.

2.3 FLOOR SLAB FILL (Upper 4 inches)

A. Material shall be non-expansive granular soil with less than 5 percent passing the No. 200 sieve, and free from rocks larger than 2 inches in the largest dimension, frozen lumps, roots, trash, lumber and organic material. The natural soils may be used as fill for the first 4 inches directly under the slab where it meets the above stated criteria.

2.4 FLOOR SLAB

A. Material shall be non-expansive granular soil with less than 50 percent passing the No. 200 sieve, with a liquid limit less than 30, and free from rocks larger than 6 inches in the largest dimension, frozen lumps, roots, trash, lumber and organic material. The natural soils may be used as fill below the first 4 inches under the slab where it meets the above stated criteria.

2.5 3/4" WASHED ROCK

A. 3/4" Washed Rock shall consist of hard, durable particles of stone or gravel, screened or crushed, to the required size and gradation. The material shall be free from vegetation matter, lumps or balls of clay, or other deleterious matter and shall conform to the following gradation when tested in accordance with AASHTO T 27 or ASTM C 136.

Sieve Size (Square Opening)	Percent By Weight Passing Screen
3/4-inch	100
3/8 inch	78-92
No. 4	0 - 50
No. 8	0 - 5
No. 200	0 - 3

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavation shall be performed to the lines and grades indicated. Excavated material not required or not satisfactory for backfill shall be removed from the site.

B. Excavations shall be braced and supported as needed to prevent the ground adjacent to the excavation from sliding or settling. Slides shall be promptly removed and corrected by CONTRACTOR.

3.2 PREPARATION

A. Limits of shallow site over-excavation and fill requirements extend to 4 feet beyond curb line, as indicated on Sheet C-1A Note 1 in Contract Drawings.
B. Refer to “Geotechnical Notes” on Sheet S-1B in Contract Drawings.
C. Compact subgrade to density requirements for subsequent backfill materials.
D. Cut out soft areas of subgrade not capable of compaction in place. Backfill with granular fill and compact to density equal to or greater than requirements for subsequent fill material.
E. Scarify subgrade surface to depth of 6 inches.

3.3 DEWATERING

A. Water removal shall be in accordance with Section 31 23 19 - Dewatering.

3.4 BACKFILL

A. Backfill material shall not be placed against concrete structures that have not been properly cured. No backfill material shall be placed until concrete has cured for a minimum of 7 days or until the compressible strength is 3,400 psi, whichever is greater.

B. Backfill material shall be placed in no more than 6-inch loose lifts for compaction by hand operated machine compactors, and 8 inches loose lifts for other than hand operated machines.

C. Structural fill placed beneath foundations, footings or the floor slab shall be placed and compacted to at least 96% of maximum dry density at a moisture content within 2 percent of optimum moisture content in accordance with ASTM D 1557.

D. Backfill material shall be placed and compacted to at least 95 percent of maximum dry density at a moisture content within 2 percent of optimum moisture content in accordance with ASTM D-1557.

E. Where the moisture content is not suitable and/or sufficient compaction has not been obtained, the fill shall be reconditioned to an approved moisture content and re-compacted to the minimum required compaction prior to placing any additional fill material.

F. CONTRACTOR shall be responsible for arranging for the placing and compacting of approved fill material in accordance with these Specifications. If it is determined that CONTRACTOR is failing to meet the minimum requirements, CONTRACTOR shall stop operations and make adjustments as necessary to produce a satisfactorily compacted fill at no additional cost to OWNER.

G. Sufficient personnel, equipment, sumps or other means should be provided to maintain the site in an acceptable dry condition for the duration of this contract.

H. Excavations shall be so braced and supported as needed to prevent the ground, adjacent to the excavation, from sliding or settling. Localized slides or settlements shall be promptly removed and corrected by CONTRACTOR.

3.5 FINISHED GRADE

A. The finished subgrade and grade of the fill shall not vary more than 0.05 feet from the established grades and cross sections shown on the Drawings.

3.6 COMPACTION TESTS

A. Compaction testing shall be the provided and paid for in accordance with Section 01 45 00 – Quality Control and Materials Testing.

B. It shall be the responsibility of CONTRACTOR to accomplish the specified compaction for backfill, structural fill, Untreated Base Course and other earthwork. It shall be the responsibility of CONTRACTOR to control his operations by performing any additional tests necessary to verify and confirm that CONTRACTOR has complied, and is complying at all times, with the requirements of these Specifications concerning compaction, control, and testing.

1. Testing of Backfill Materials

    a. Characteristics of backfill materials shall be determined in accordance with the requirements of Section 01 45 00.
    b. Contractor shall demonstrate the adequacy of compaction equipment and procedures before exceeding any of the following amounts of earthwork quantities:

1) One (1) test per 1.0 feet of backfill thickness placed per structure.

c. Until the specified degree of compaction on the previously specified amounts of earthwork is achieved, no additional earthwork of the same kind shall be performed.
d. After satisfactory conclusion of the initial compaction demonstration and at any time during construction, earthwork which does not comply with the specified degree of compaction shall not exceed the previously specified quantities.
e. Quality Control tests may be made by Engineer to verify that compaction is meeting the requirements previously specified at no cost to Contractor. If Engineer requires retesting of backfill, CONTRACTOR shall remove the overburden above the level at which Engineer wishes to test and shall backfill and recompact the excavation after the test is complete at no additional cost to OWNER.
f. If compaction fails to meet the specified requirements, Contractor shall remove and replace the backfill at proper density or shall bring the density up to specified level by other means acceptable to Engineer. Subsequent tests required to confirm and verify that the reconstructed backfill has been brought up to specified density shall be paid in accordance with Section 01 45 23 – Testing Agency Services. The confirmation tests shall be performed in a manner acceptable to Engineer. Frequency of confirmation tests for remedial work shall be double that amount specified for initial confirmation tests.

2. Field Density Tests

a. Tests shall be performed in sufficient numbers to meet the requirements of Section 01 45 00 and to ensure that the specified density is being obtained.

C. Field density tests shall be made in accordance with ASTM D-1557 and ASTM D-6938.

- END OF SECTION -

SECTION 32 31 33
CANTILEVER SLIDE GATE & OPERATORS

PART 1 GENERAL

1.1 SUMMARY

A. The Work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete installation of pre-wired, self-contained, slide gate operator(s) and horizontal cantilever sliding gates, including all selected attachments and accessory equipment specified for all Hydraulic Operator System(s) required for this project in strict accordance with this specification.

B. Install cantilever slide gates, complete with operators, where indicated in the Contract Documents.

1.2 RELATED DOCUMENTS

A. Section 01 33 13 - Submittal Procedures

B. Section 01 78 00 - Closeout Submittals

C. Section 01 79 00 - Demonstration and Training

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. Related work specified in other Sections includes, but is not limited to:

1. Section 03 30 00 Cast-in-Place Concrete: Structural portal foundations.

1.4 SYSTEM DESCRIPTION

A. Modular automated cantilevered vehicular access gate for closure of vehicular access routes and regulation of traffic flow. Unique construction completely eliminates the cross bracing commonly used on cantilever gates, which is both unsightly and compromises security, by providing a foothold to climbers. Always supply a separate pedestrian entrance when foot traffic is anticipated near an automated gate. Section includes the following components:

1. Aluminum and steel cantilever sliding gate
2. Electric gate operator
3. Gate support posts (structural portals) and rolling hardware.
4. Gate operator accessories including safety and reversing devices.

   Accessed control devices to be included.
   a. key pad
   b. 10 remotes
   c. and push button.

1.5 SUBMITTALS

A. Product Data

1. Gates and hardware.
2. Gate operator including operating instructions, motor name plate data, ratings, characteristics and mounting arrangement.

B. Shop Drawings:

1. Submit shop drawings in accordance with Section 01 33 13 - Submittal Procedures.
2. Gate Operator:
    a. Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
    b. Submit drawings showing connections to adjacent construction, range of travel, and all electrical and mechanical connections to the operator.
    c. Drawings shall also show the size and location of the concrete mounting pad.
3. Wiring Diagrams: Power and control wiring [and access controls if applicable].
    a. Differentiate between manufacturer-installed and field-installed wiring and between components provided by gate and gate operator manufacturer and those provided by others.
    b. Include underground electrical runs and inductive vehicle obstruction and free exit loop locations, and dimensions.
4. Include complete details of gate construction, gate height, structural support spacing dimensions and unit weights of structural components.
5. Cantilever gates shall be designed to span the distance of the opening and offset back one half the distance of the opening.
6. All joints shall be welded joints and welds shall be ground smooth prior to hot-dip galvanizing.
7. Provide detailed diagrams of all gate components.
8. Gates shall comply with ASTM F 1184 for single and double slide gates.

C. Installation instructions:

1. Submit two copies of manufacturer's written installation instructions.

D. Test reports:

1. Submit affidavits from the manufacturer demonstrating that the gate mechanism has been tested to 200,000 cycles without breakdown.
2. ISO 9001 Compliant manufacturer.

1.6 QUALITY ASSURANCE

A. Manufacturer: A company specializing in the manufacture of cantilever slide gates and electric gate operators of the type specified, with a minimum of five years experience.

B. Installer Qualifications: an experienced installer who has completed fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Source Limitations for Gates operators and Gates: obtain each color, grade, finish, type, and variety of components for fences and gates from one source with resources to provide fences and gates of consistent quality in appearance and physical properties.

D. Electrical Components, Devices, and Accessories: listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. UL Standard: Provide gate operators, tested and listed by a nationally recognized testing laboratory to comply with UL 325 5th edition

F. Emergency Access Requirements: comply with requirements of local authorities having jurisdiction for automatic gate operators serving as a required means of access.

G. Installer: A minimum of three years experience installing similar equipment and approved by manufacturer

1.7 WARRANTY

A. Provide a two-year warranty against all defects in material and workmanship.

PART 2 PRODUCTS

2.1 CANTILEVERED ACCESS GATE

A. Manufacturers, or equal

1. Ameristar Fence Products (TransPort II Ornamental Cantilever Gate)

2.2 GATE CONTROLS

A. Slide Gate Operator and Motor

1. Supplier: HySecurity

B. Slide Gate Security Access – card reader & pedestal

1. Supplier: Yamas Controls

2.3 MATERIALS

A. Electrical components: CSA/UL approved.

B. Power Supply: 208-volt three phase or single phase or 120-volt, 50/60 Hertz, single phase. If gate motor requires 240-volt single phase suppler must provide buck boost transformer to be mounted inside by the panel.

2.4 COMPONENTS: TYPE II CANTILEVER SLIDE

A. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1184 and Specification 09 90 00 Painting and Coatings for protective coatings.

B. Frames and Bracing: Fabricate members from galvanized steel or aluminum tubing and structural shapes of sufficient size and strength to support the weight of the gate as well as any live loadings, including but not limited to wind, snow and ice loads, with outside dimension and weight according to ASTM F 1184 and the following minimums:

1. Gate Height: 7 feet.
2. Gate Opening Width: see drawings for access road width.
3. Frame Members:
    a. Tubular Steel or Aluminum: 1.66 inches (or as recommended by manufacturer)
4. Bracing Members:
    a. Tubular Steel or Aluminum: 1.90 inches round (or as recommended by manufacturer)

C. Frame Corner Construction:

1. Welded frame and 5/16-inch diameter, adjustable truss rods for panels 5 feet wide or wider.

D. Roller Guards: As required per ASTM F 1184 for Type II gates.

E. Hardware

1. Latches permitting operation from both sides of gate, locking devices, hangers, and stops fabricated from galvanized steel. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate. Latches shall permit operator to catch and align the gate properly when closed.
2. Rollers: Rollers shall be made of nylon. Placement of the rollers on the offset posts shall be designed to ensure proper alignment of the gate.

2.5 OPERATION

A. Operation shall be by means of a metal rail passing between a pair of solid metal wheels with polyurethane treads. Operator motors shall be hydraulic, geroller type, and system shall not include belts, gears, pulleys, roller chains or sprockets to transfer power from operator to gate panel. The operator shall generate a minimum horizontal pull of 300 pounds without the drive wheels slipping and without distortion of supporting arms. Gate panel velocity shall not be less than 12 inches per second and shall be stopped gradually to prevent shock loads to the gate and operator assembly. The “soft stop” feature of the gate operator shall be controlled by two adjustable hydraulic brake valves (one for each direction). The “soft start” feature shall allow the pump to start at zero pressure, then progressively increase the pressure, over a period not less than two seconds, to 1,000 PSI.

B. Standard mechanical components shall include as a minimum:

1. Supporting arms: Cast aluminum channel. Arms shall incorporate a fully bushed, 1-1/2" bronze bearing surface, acting on arm pivot pins. (Item 2 below)
2. Arm pivot pins: 3/4" diameter, stainless steel, with integral tabs for ease of removal.

3. Tension spring: 2-1/2" heavy duty, 800 pound capacity.
4. Tension adjustment: Finger tightened nut, not requiring the use of tools.
5. Drive release: Must instantly release tension on both drive wheels, and disengage them from contact with drive rail in a single motion, for manual operation.
6. Limit switches: Fully adjustable, toggle types, with plug connection to control panel.
7. Electrical enclosure: Oversized, metal, with hinged lid gasketed for protection from intrusion of foreign objects, and providing ample space for the addition of accessories.
8. Chassis: 1/4" steel base plate and 12 Ga. sides and back welded and ground smooth.
9. Cover: 10GA. sheet steel, hot-dip galvanized, and gasketed. Box shall be powder coated black. All joints welded, filled and ground smooth. Finished corners square and true with no visible joints.
10. Drive wheels: 6" Diameter metal hub with polyurethane tread.
11. Drive rail: Shall be extruded 6061 T6, not less than 1/8" thick. Drive rail shall incorporate alignment pins for ease of replacement or splicing. Pins shall enable a perfect butt splice.
12. Hydraulic hose: Shall be 1/4" synthetic, rated to 2750 PSI.
13. Hydraulic valves: Shall be individually replaceable cartridge type, in an integrated hydraulic manifold.
14. Hose fittings: At manifold shall be quick-disconnect type, others shall be swivel type.
15. Hydraulic fluid: High performance type with a viscosity index greater than 375 and temperature range -40F to 167F degrees (-40C to 75C).
16. A zero to 2000-PSI pressure gauge, mounted on the manifold for diagnostics, shall be a standard component.
17. The hydraulic fluid reservoir shall be formed from a single piece of metal, nonwelded, and shall be powder coated on the inside and the outside, to prevent fluid contamination.

C. Minimum standard electrical components:

1. Pump motor: Shall be a 1 HP, 56C, TEFC, continuous duty motor, with a service factor of 1.15, or greater. Standard voltages available, single or three phase.
2. All components shall have overload protection.
3. Controls: Smart Touch Controller Board with 256K of program memory containing:
    a. inherent entrapment sensors, redundant, independent system required;
    b. built in “warn before operate” system;
    c. built in timer to close;
    d. liquid crystal display for reporting of functions; system configuration control status;
    e. 26 programmable output relay options;
    f. anti-tailgate mode;

g. Reversal Time Delay: Designed to protect gate system from shock load on reversal in both directions;
h. Maximum Run Timer: Designed to prevent damage to gate system by shutting down system if normal time to open gate is exceeded;
i. built-in power surge/lightning strike protection;
j. adjustable limit switches, interlocked with motor controls and set to automatically stop gate at fully retracted and fully extended positions;
k. menu configuration, event logging and system diagnostics easily accessible with a PC utilizing operator manufacturer's START software;
l. RS232 port for connection to laptop or other computer peripheral and RS485 connection of Master/Slave systems or network interface;
m. System shall be integrated with other onsite- controls and systems. See Electrical Controls Drawings and Specifications.

4. Transformer: 75 VA, non-jumpered taps, for all common voltages.
5. Control circuit: 24VDC.
6. Master/Slave capabilities for dual gates.

D. Gate edges shall be installed such that the gate is capable of reversing in either direction upon sensing an obstruction.

E. Control Devices: Card reader, and keypads.

F. Alert Devices: Configurable audible beacon shall be included as standard.

G. The following optional devices shall be included:

1. Lock for operator cover.
2. Drive wheel manual release indicator switch.
3. Heater with thermostat control for cold or damp climates.
4. Weather-stripped drive rail slot in chassis, and snow wiper blades for drive rail.
5. Pneumatic remote gate release devices. Places operator in "manual mode" from remote location (lockable box on public side of gate).
6. HySecurity factory drive rail.
7. Fire Box with equipment required to manually operate gate.

H. Emergency Release Mechanism: Quick-disconnect release of operator drive system of the following type of mechanism, permitting manual operation if operator fails. Design system so control circuit power is disconnected during manual operation.

1. Type: Mechanical device, key, or crank-activated release. See attached cut sheet for Fire and Emergency Access Lock Box.

I. Vehicle Loop Detector: System including automatic closing timer with adjustable time delay before closing, timer cut-off switch, and loop detector designed to open and close gate, and hold gate open until traffic clears. Provide electronic detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire

and to emit a signal activating the gate operator. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location as recommended in writing by detection system manufacturer for function indicated.

1. Loop: Factory preformed style for saw-cut with epoxy-grouted installation
2. BD Loops RL 5240, or as recommended by the loop manufacturer
3. Induction loops shall be compatible and shall work in conjunction with the specified access controllers and gate operators.
4. Approved equal.

J. The installing contractor shall be responsible to ensure that appropriate external primary entrapment safety devices be installed for the specific site conditions to protect against all potential entrapment zones. Proper operation of these safety devices shall be verified and training as to the operation and maintenance of these devices for the users and owners shall be documented.

K. Operator Manufacturers:

1. HySecurity: model SlideDriver 40 (222 E ST) with Smart Touch Controller for single cantilever slide gates.
2. HySecurity: model SlideDriver 15 (222 SS ST) with Smart Touch Controller for duel cantilever slide gate (NOT USED).
3. Approved equal.

2.6 ACCESSORIES & OPTIONS

A. Vehicle obstruction devices

1. Inductive loop vehicle detectors: Micro-processor based, digital type, with sensitivity to detect a wide variety of vehicle sizes. Built in frequency counter and automatic frequency assignment to prevent any possibility of ‘cross talk’.
2. Inductive vehicle Loop: select either ‘pre-formed’ type or ‘saw cut’ field constructed type. Size, location and construction type should be shown on drawing.

B. Safety Devices: (Note: The word “Safety” only applies to devices intended to reduce likelihood of a gate striking or injuring a pedestrian. See ‘obstruction devices’ for vehicular reversing options).

1. Through- Beam photo cells
2. Radio transmitting 5’ gate contact edge and radio receiver

C. Notification or instructive Devices:

1. Audible beacon
2. Strobe or flashing light indicating gate in motion or pending motion.
3. Traffic indicator lights (8” Green arrow / Red “X” typical)

D. Access control devices, see section 028000 – electronic security devices including access controls.

E. Gate panel options

1. Substitute 3 strands of non-barbed wire top

2.7 FINISHES

A. The manufactured gate components shall be subjected to a thermal stratification coating process (high-temperature, in-line, multi-stage, and multi-layer) including, as a minimum, a six-stage pretreatment/wash and an electrostatic spray application of a polyester finish. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be Black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1 below.

Table 1 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,000 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

PART 3 EXECUTION

3.1 INSTALLATION

A. Install structural post (portals) in concrete foundations with a minimum depth of 48-inches.

B. Posts shall be installed completely level both horizontally and vertically.

C. Install cantilevered sliding access gate to manufacturer's written instructions.

D. Test and adjust complete system for proper function and leave in perfect working order.

E. Install vehicle detection loops and lead-in-wires per manufacturer’s instructions.

F. Supply and install other electrical wiring, conduit junction boxes, transformers, circuit breakers and auxiliary components required for complete installation. Conform to CSA/NEC and local requirements.

3.2 FIELD QUALITY CONTROL

A. Test gate operators through ten full cycles and adjust for operation without binding or scraping.

B. Owner or owner’s representative, shall complete “punch list” with installing contractor prior to final acceptance of the installation and submit completed warranty documentation to manufacturer

3.3 CLEANING, MAINTENANCE AND DOCUMENTATION

A. Perform cleaning and maintenance procedures in strict accordance with manufacturer’s written instructions.

B. Train owner's personnel on how to safely shut off electrical power, release and manually operate the gate. Additionally, demonstrate the general maintenance of the gate operator and accessories and provide copy of "Installation and Maintenance Manual” for the owner. Manual will identify parts of the equipment for future procurement.

C. Maintain logbook of repairs and maintenance.

- END OF SECTION -

SECTION 33 11 33
PUMP AND PUMP MOTOR_ADDENDUM 2

PART 1 GENERAL

1.1 DESCRIPTION

A. Furnish, deliver and install a product lubricated surface discharge deep well turbine pump into existing well casing of 20-inches in diameter to depths as shown on the drawings.

B. All pumps supplied under this specification shall be suitable for pumping drinking water. All components, material, coatings, manufacturing, and performance standards shall be in compliance with AWWA E103 and shall be certified to NSF 61 and all applicable joint standards such as NSF 372 and NSF 600. Contractor shall submit documentation necessary to verify all components, materials, and coatings meet these requirements.

1.2 REFERENCES

A. Work covered by this Specification shall meet or exceed the provisions of the latest editions of the following Codes and Standards in effect at the time of award of the Contract:

B. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

1. ANSI B 16.1 Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1. ASTM A 36 Structural Steel
2. ASTM A 48 Gray Iron Castings
3. ASTM A 53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
4. ASTM A 108 Steel Bars, Carbon, Cold Finished, Standard Quality

D. AMERICAN WATER WORKS ASSOCIATION

1. AWWA C 651 Standard for Disinfecting Water Mains
2. AWWA C 652 Standard for Disinfecting of Water-Storage Facilities
3. AWWA E 103 Horizontal Centrifugal and Vertical Line Shaft Pumps

1.3 SUBMITTALS

A. CONTRACTOR shall submit for review to the ENGINEER, sufficient literature, detailed specifications, and drawings to show dimensions, make, style, speed, size, type, horsepower, head-capacity, efficiency, materials used, design features, internal construction, weights, and any other information required by ENGINEER for review of all pumping equipment. No pumping equipment will be accepted, and installation will not be allowed, until such review has been completed. All submittals shall clearly state any deviations from the specified requirements. The following shall also be furnished with the submittal:

1. Performance data curves showing head, capacity, horsepower demand, and pump efficiency over the entire operating range of the pump, from shutoff to maximum

capacity. The equipment manufactured shall indicate separately the head, capacity, horsepower demand, overall efficiency, and minimum submergence required at the specified design point.

2. Equipment manufactured shall provide complete and detailed information regarding the installation of the pumps. Any installation requirements or operating conditions which the supplier or manufacturer' feel to be critical to the safe and reliable operation of the pumps should be identified and described in detail.
3. Shop drawings submitted for review also shall include electrical diagrams, schematic control diagrams, and a detailed description of how the control system is to function.

1.4 OPERATING CONDITIONS

A. Table I indicates the operating conditions of the pumps.

TABLE I
OPERATING CONDITIONS DEEP WELL TURBINE PUMP

DESCRIPTION	WELL #8
Design capacity of pump (gpm)	600
Design total dynamic head (feet)	747
Pump Setting Depth	600
Nominal Operating Speed (rpm)	1800
Minimum Efficiency at Design Point	80%
Maximum NPSHR at Design Point	12.1 feet
Minimum Motor Horsepower	150
Minimum Column Size (diameter)	6-inch
Minimum Shaft Size (inches)	1-1/2 (C1045)
Diameter of Well Casing	20-inch (19" I.D.)
Maximum Bowl Diameter	13 in.
Approx. Elevation (ft. above MSL)	4,920
Model No.: National	K10MC (17 stage)
Utility Power (volts, phase, hertz)	480, 3, 60

1.5 MECHANICAL DEFECTS AND REJECTIONS

A. CONTRACTOR furnished pumps that have mechanical defects or do not meet the requirements for head-capacity, horsepower, efficiency, and vibration requirements will be rejected, and shall be replaced without additional cost to OWNER for furnishing, removal,

reinstallation, and retesting. Mechanical defects shall include excessive vibration, improper balancing of any rotating parts, improper tolerances, binding, excessive bearing or motor heating, defective materials, including materials that do not conform to the Specifications, improper fitting of parts, and any other defect which will in time damage the pump or unreasonably impair its efficiency or operation.

1.6 WARRANTY

A. CONTRACTOR furnished equipment covered by these specifications shall be warranted against defective parts due to faulty material or workmanship for one (1) year after date of installation. CONTRACTOR shall guarantee to replace any defective parts within the period of time specified at no additional cost to OWNER. If CONTRACTOR has to pull pump to replace defective parts, CONTRACTOR shall guarantee to pull and replace pump at no additional cost to OWNER.

PART 2 PRODUCTS

2.1 DEEP WELL VERTICAL TURBINE PUMP

A. The pumps shall be of the deep well, product lubricated, vertical turbine type suitable for pumping drinking water. All material, manufacturing and performance standards shall be in accordance with AWWA E 103, NSF 60, NSF 61, and NSF 372 as applicable.

B. Performance Requirements

1. Pump Speed - The pump shall operate as specified in Table I.
2. Pump Characteristics - The pump shall be characterized by head capacity curves of steadily decreasing head with increasing capacity. Maximum head shall be at zero flow. The pump shall have a minimum efficiency as provided in Table I during operation against the system head. Pump head - capacity curves shall indicate that these losses have been included. Pumps shall have head-capacity curves similar to that of the specified pump. Pumps having curves that show a flatter or near horizontal slope over a section in the head – capacity curve will not be accepted. Curves with head-capacity curves with slopes of the curve flatter than that shown for the specified pump will not be accepted.
3. The pump and motor shall be capable of producing the flow rate and total dynamic heads indicated in Table I.
4. Motor Characteristics - Under no operating conditions shall the required pump brake horsepower exceed the nameplate rating of the motor being furnished.
5. The pump shall be designed to operate throughout its entire range without excessive vibration or noise.

C. Vertical Turbine Pump Components

1. Pumps
   a. The vertical turbine pump for the well shall be as manufactured by National Pumps or approved equal and shall be a multi stage product lube bowl assembly (or equal).
   b. Unless otherwise stated herein, the pump shall in all respects conform to the American National Standard ANSI/AWWA-E103 for “Horizontal Centrifugal and Vertical Line Shaft Pumps” and shall comply with all local and state sanitary and safety regulations.

2. Discharge Head
    a. The discharge head shall be fabricated steel (ASTM A53 Grade B Pipe and ASTM A 36 Steel Plate), accurately machined and with a surface discharge. Discharge flange shall be machined and drilled to ANSI standards for 150 lb. rating and shall be sized to match the specified system. The top of the discharge head shall have a rabbet fit to accurately locate the vertical hollow shaft driver, and have a diameter equal to the driver base diameter (BD) and not less than 20.5- inches. Lifting lugs of sufficient strength to support the weight of the complete unit shall be provided. The base shall be round or square. Head must be able to accept the monitoring tube, well vent, and other tubing as shown on the drawings. CONTRACTOR shall modify the well base dimensions on the drawings to match supplied head.
    b. The discharge head shall be equipped with a tube tensioning device to apply and maintain proper tension to the shaft enclosing tube. This device shall consist of a cast iron ASTM A48 Class 30 tube tension plate and bronze ASTM B584 alloy C83800 combination tube tension nut and bearing. Tension shall be applied to the shaft enclosing tube through internal threads in the top tube After proper tensioning, nut shall be locked into position with a steel cap screw. Sealing between the plate and the discharge head and the plate and shaft enclosing tube shall be accomplished by means of “O” rings.
    c. The top line shaft (head shaft) shall be of C1045 Grade Carbon Steel and shall not exceed 10 feet in length. Impeller adjustment shall be provided at the top of the head shaft by means of a bronze adjusting nut of ASTM B584 alloy C83800 which shall be positively locked in position.
    d. A lifting soleplate shall be supplied and installed, if required by the pump manufacturer.
    e. The pump manufacture shall include the method of adjusting the pump impellers at the top of the head shalt. This method shall provide a positive locking device.
    f. CONTRACTOR shall be responsible for ensuring that the discharge head is structurally and mechanically adequate for the provided and installed pump configuration.
3. Column Assembly
    a. The line shaft for the well shall be of C1045 Carbon Steel (118,000 psi min.). They shall be furnished in interchangeable sections not over 10 feet in length.
    b. The butting faces shall be machined square to the axis of the shaft, with maximum permissible axial misalignment of the thread axis with the shaft axis 0.002" in 6". The size of the shaft shall be no less than that determined by ANSI/AWWA E103 Specifications, Section 5.5 for C1045 line shaft, and shall be such that elongation due to hydraulic thrust will not exceed the axial clearance of the impellers in the pump bowls. Maximum runout in 10-feet shall not exceed 0.005-inches.
    c. The line shaft bearing shall be of 70 minimum shore hardness, Bronze C89835, snap-in type, internally spiral grooved to flush out sand and other abrasives and mounted in ductile iron A536 Gr. 60-40-18 bearing retainers held in position in the column coupling by means of the butted ends of the column pipe. Bearing spacing shall not exceed 10 feet.
    d. The outer column piping shall be of ASTM A53 Grade B Schedule 40 steel pipe in interchangeable sections not over 10 feet in length with the ends of each section faced parallel and machined with 8 straight threads per inch permitting the ends to butt and ensuring alignment when connected by standard mill steel couplings. The weight of the column pipe shall be no less than that stated in ANSI E 103, Section 5.1, “Standard Specifications for Discharge Column Pipe”. Top and bottom sections of column pipe shall not exceed 5-feet in length.

e. CONTRACTOR shall be responsible for ensuring that the column piping is structurally and mechanically adequate for the provided and installed pump configuration.

4. Pump Bowl Assembly
   a. Pump bowl castings shall be of close-grained cast iron ASTM A48 Class 30 or ASTM A536 ductile iron Class 60-40-18 where required to meet the hydrostatic pressure criteria listed below. The water passages shall be free of blowholes, sand holes, and other detrimental defects, shall be lined with porcelain enamel, and shall be accurately machined and fitted. The finished bowls shall be capable of withstanding a hydrostatic pressure equal to twice the head at rated capacity or 1-1/2 times the shut-off head, whichever is greater.
   b. The impellers shall be bronze ASTM B584 alloy C83800, enclosed type, and shall be statically balanced, and shall be fastened securely to the impeller shaft with taper split bushings of steel. Impellers shall be adjustable vertically by an external means. Impeller skirt and series case throat area shall be thick enough to allow for machining and wearing at the time of repair. The bowl wear rings shall be dissimilar from impeller wear rings. The Bowl Wear Rings shall be 416 Stainless Steel. The impeller wear rings shall be 316 Stainless Steel.
   c. The pump shaft shall be of C1045 Carbon Steel turned, ground and polished. Bearings shall be Morse Marine Bearings consisting of sleeve bearings with a Naval Brass outer shell super-bonded to a fluted rubber bearing surface (or approved equal) above and below each impeller. The pump shaft shall have chromed journals at the bearing points. The size of the shaft shall be no less than that determined by ANSI/AWWA Specifications E103, Section A4.3, Paragraph 4.3.3.
   d. The discharge case shall be threaded on the outside for column sizes up to 14 inches and fitted with a cast iron ASTM A48 Class 30 column adaptor of the proper size to connect to the column selected. Likewise, the suction case shall also be threaded on the O.D. and fitted with a cast iron or steel suction adaptor.
5. Suction Pipe and Strainer.
   a. The suction pipe shall not be required.
   b. A 316 Stainless Steel cone strainer shall be provided having a net inlet area equal to at least four times the suction pipe area. The maximum opening size shall not be more than 75% of the minimum opening of the water passage through the bowl or impeller.

2.2 FACTORY TESTING

A. Equipment shall be factory tested and inspected as specified hereinafter. All costs for the tests shall be borne by CONTRACTOR. Conduct the following tests on each indicated pump system:

1. Factory Non-Witnessed Test
   a. Perform tests using the complete pump system to be furnished, including the project motor and variable speed drive, if equipped with a variable speed drive.
   b. For pumps with motors smaller than 150 hp, the manufacturer's certified test motor will be accepted.
   c. Testing of prototype models will not be accepted.
   d. Conduct the following minimum tests and submit the test results:
      1) Hydrostatic Test;
      2) Performance Test:

a) Conduct performance test at maximum speed, obtain a minimum of 5 hydraulic test readings between shutoff head and 25 percent beyond the maximum indicated capacity, and record on data sheets as defined by the Hydraulic Institute standards;
b) For variable speed pumps, test each pump between maximum and minimum speed at 100 rpm increments;
c) Submit pump curves showing head vs. flow, bhp, KVA, KW, and efficiency results;

3) Mechanical Test:
a) Submit certification signed by a senior official of the pump manufacturer that the pump shaft horsepower demand did not exceed the rated motor horsepower of 1.0 service rating at any point on the curve.
b) Submit test results to ENGINEER for review prior to delivery of the pumps to the Site.

2. In the event of failure of any pump to meet any of the requirements, make necessary modifications, repairs, or replacements in order to conform to the requirements of this Section and re-test the pump until found satisfactory.

2.3 ANALYSIS

A. Tests may be conducted with shop motor to facilitate the manufacturing process.

B. A minimum speed curve shall be plotted on the performance curve, based on the affinity laws and the test data.

C. All gauges shall be calibrated within 30 days of the scheduled test and certified calibration data shall be provided. All flow meters and other test instruments shall be calibrated as required by ANSI/HI standards.

D. In order to ensure that neither harmful nor damaging vibrations occur to the pump structure at any speed within the specified operating range, the following analysis shall be required:

1. Pump manufacturer shall perform a structural frequency analysis of the above ground structural components utilizing a FEA method to ensure that no structural natural frequencies are excited to a degree that would cause measured vibration amplitudes at the top of the discharge head to exceed the requirements of ANSI/HI 9.6.4-2009. When deemed necessary by the experience of the manufacturer, the below ground structural components shall also be included in the analysis.
2. The FEA method should include the use of ProE/Mechanica or an equivalent software. All pump assembly components, including the motor, shall be represented as solid elements, and if idealizations are used in place of solid elements, then a complete description of method for the idealization shall be included in the report. The analysis shall also include all modes of interest and pictorially represent each mode shape. Modes of interest are defined as those structural frequencies that exist below 120% of the maximum operating speed. When significant modifications are required to lower the system's natural frequency, the pump structure's stresses and deflections shall also be reviewed. Analysis reports shall conclude acceptable operation at the analyzed operating speeds. The design critical frequency shall be at least 20% above or below the operating range of the pump.

E. Manufacturer to provide documentation of the analysis ensuring that the specified requirements have been met, and that documentation should be signed and stamped by the professionally licensed engineer who performed the analysis work.

F. When measured in the direction of maximum amplitude on the pump and motor bearing housings, shall not exceed limits given in the latest ANSI/HI nomograph for the applicable pump type.

2.4 MOTOR

A. Pump motors shall be a vertical hollow shaft, premium efficiency, inverter duty, electric motor, and shall be sized as noted in Table 1. They shall have a non-reverse ratchet, P-base, squirrel cage induction design. Motor shall have Class B or Class F insulation with temperature rise as specified by NEMA standards for class of insulation used and shall have a 1.15 service factor. The pump motor will be operating in an ambient temperature range of 40° - 110° Fahrenheit.

B. Pump motors shall be provided with a vibration switch. Switch rating 120 VAC, 2 amps minimum.

C. Thrust bearing shall be chosen to handle the continuous down-thrust as specified by the pump manufacturer with an AMBA 60,000 hr L-10 life. Provisions shall be made for momentary up-thrust equal to 30% of rated down-thrust.

D. The motor shall be suitable for across-the-line starting, soft start, and shall be capable of reduced-voltage starting.

E. The motor rating shall be such that at design it will not be loaded beyond nameplate rating and at no place on the pump curve shall the loading exceed the service factor.

F. The motor temperature shall be rated no higher than the allowable operating temperature of the motor thrust and radial bearings and in no case shall it exceed the temperature rating of the insulation class used to wind the motor.

G. The junction box shall be oversized to accommodate wiring connection.

2.5 APPURTENANCES

A. Well Monitoring Tube

1. The CONTRACTOR shall furnish and install two 1 1/2-inch diameter well monitoring tubes in each well consisting of Schedule 80 PVC pipe. The tubes shall be furnished in sections not over 20 feet in length (10 ft lengths are acceptable) and shall be joined with flush threaded couplings. The PVC tube shall be joined and banded to the pump column with stainless steel bands at maximum of 10 feet. A minimum of two 1/4-inch diameter vent holes for every 10 feet of length shall be provided throughout the entire length of the monitoring tube. The depth of the monitoring tube shall be as indicated on the drawings. The bottom end shall be capped.

B. Well Vent

1. The well vent shall consist of galvanized steel 1 inch diameter pipe through the well surface plate extended up to 18" above the bottom plate of the pump discharge head

with a 180 degree bend made of two steel ells. The outlet end of the vent pipe shall be covered with No. 14 stainless steel wire mesh securely fastened by a stainless steel band. The lower end of the vent pipe shall be threaded into the well surface plate and provide a water tight seal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install pump and motor at the location shown on the drawings and according with manufacturer's recommendations.

B. All pumps, complete with drive system, in place at the jobsite, shall not exceed acceptable field vibration limits given in the latest revisions of the Hydraulic Institute Standards. All pumps shall be free of static unbalance; shall be free of dynamic unbalance up to the maximum speed of the pump and drive system; shall be free of torsional vibration from 10 percent below the minimum speed to 10 percent above the maximum speed of the pump and drive system; and shall be free of apparent unbalance caused by defective bearings, by close fittings parts which may rub on the rotating parts intermittently, or by loose discs or rotor parts, or unbalanced loads.

C. The motor/discharge head assembly shall be shimmed with respect to the well casing flange to bring the motor/discharge assembly into optimum alignment with any variations that the pump column and line shaft may exhibit from being truly plumb. Such shims must be structurally sound and securely attached. The water tight seal between the discharge head and the well casing flange must be maintained.

3.2 FIELD TESTS

A. After installation, the pump shall be given an operating test to demonstrate freedom from mechanical defects, excessive noise, and vibration. The test shall include operating the pump continuously while throttling the discharge as needed. The operating test shall be performed for a minimum of one hour, or as directed by ENGINEER. Pumps with variable speed drives shall be tested at maximum speed, and at the average and minimum speeds listed under the specification for the pumps. A copy of actual test data shall be furnished to ENGINEER.

B. Tests for acceptable vibration shall be made, at no additional cost to OWNER, in the field on each pump system, which in the opinion of ENGINEER, seem to have excessive vibration. All field tests shall be running tests with the pump pumping the product for which it is intended and each pump system shall be tested separately with no other pumps running. All testing shall be done in the presence of ENGINEER. Amplitude as used in this Specification, shall mean total peak-to-peak displacement. The required test for acceptable vibration will be the measurement of this peak-to-peak displacement and will be performed with an IRD Vibration Meter, Model 306; Bently-Nevada TK-8; or equal.

3.3 DISINFECTING

A. Source of Water

1. The Contractor shall assume all responsibility to obtain the necessary water supplies for disinfection of the pumping system.

B. Testing Procedure

1. Leakage and pressure testing must be completed prior to disinfection procedures.
2. All water piping installed under this Contract shall be disinfected using an approved disinfection method in accordance with the "American Water Works Association Standard for Disinfecting Water Mains" (AWWA C651)
3. Pump and related piping installed under this Contract shall be disinfected using an approved disinfection method in accordance with the "American Water Works Association Standard for Disinfecting Water Mains" (AWWA C6512).
4. Heavily chlorinated water shall not be discharged onto the ground. Upon completion of disinfection, Sodium Bisulfate ($NaHSO_3$) shall be applied to the heavily chlorinated water to neutralize thoroughly the chlorine residual remaining. Water shall be neutralized to less than 1 ppm.
5. After approval of disinfection, the Contractor shall flush the new system until the chlorine residual is a maximum of 0.3 ppm.
6. At the end of 24 hours, a bacteriological test will be performed by the Owner to insure adequate disinfection. If the initial disinfection fails to provide satisfactory bacteriological results, or shows the presence of coliform, then the line shall be re-chlorinated, flushed, and retested until satisfactory results are obtained at the expense to the Contractor.

- END OF SECTION -

SECTION 33 12 00
MECHANICAL APPURTENANCES_ADDENDUM 3

PART 1 GENERAL

1.1 SUMMARY

A. CONTRACTOR shall furnish and install all valves, and equipment, complete and operable in accordance with the Specifications.

B. Where 2 or more valves or equipment of the same type and size are required, the valves shall be furnished by the same manufacturer.

C. CONTRACTOR shall verify that flanges on pipe match the bolt hole pattern of the flanges on the mechanical appurtenances.

1.2 RELATED WORK

A. Related work specified in other sections:

1.	Section 01 33 00	Submittals
2.	Section 01 45 00	Quality Control & Materials Testing
3.	Section 01 50 00	Temporary Construction Utilities and Environmental Controls
4.	Section 31 23 15	Excavation and Backfill for Buried Pipelines
5.	Section 31 23 23	Excavation and Backfill for Structures
6.	Section 33 05 05	Ductile Iron Pipe and Fittings
7.	Section 33 05 07.1	Polyvinyl Chloride (PVC) Pressure Pipe (ASTM D 1785)
8.	Section 33 12 16	Gate Valves (Resilient Wedge Type)
9.	Section 33 92 10	Steel Pipe, Specials, and Fittings (AWWA C200, modified)

1.3 REFERENCES

A. The latest edition of the following publications form a part of these specifications to the extent referenced. The publications are referred to in the text to by basic designation only.

B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1.	A 126	Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
2.	A 216	Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
3.	B 584	Standard Specification for Copper Alloy Sand Castings for General Applications

C. AMERICAN WATER WORKS ASSOCIATION (AWWA)

1.	C 504	Rubber-Seated Butterfly Valves, 3-inch through 72-inch
2.	C 509	Resilient-Seated Gate Valves for Water Supply Service
3.	C 512	Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service
4.	C 515	Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
5.	C 518	Dual-Disc Swing-Check Valves for Waterworks Service

6. C 550 Protective Interior Coatings for Valves and Hydrants

D. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

1. B 16.1 Gray Iron Pipe Flanges and Flanged Fittings
2. B 16.34 Valves – Flanged, Threaded, and Welding End

1.4 SUBMITTALS

A. Provide submittals in accordance with Section 01 33 00 – Submittals.

B. Submit catalog cut sheets on all mechanical appurtenances including: fittings, valves, or other items shown on the Drawings referencing each item by mark number. Information shall indicate manufacturer specification compliance, Cv factor, pressure rating, and dimensional data.

PART 2 PRODUCTS

2.1 GATE VALVES

A. See specification Section 33 12 16 – Gate Valves (Resilient Wedge Type).

2.2 BALL VALVES

A. Valves shall be rated for the working pressure of the system.

B. **Stainless Steel Ball Valves** shall be full port opening stainless steel and have adjustable stem packing gland. Body and ball shall be stainless steel in accordance with ASTM A351. Seats shall be reinforced PTFE and packing stem shall be PTFE. The handle shall be Type 304 stainless steel with vinyl insulator. The valves shall conform to MSS-SP-100 and be **Apollo 76F-100, NIBCO T-585-S6-R-66-LL, Watts Series S-FBV-1**, or approved equal.

C. **Bronze Ball Valves** shall be full port opening bronze body, hard chrome plated brass ball and have adjustable stem packing gland. Seat and seals shall be PTFE. Handle shall be heavy, duty, zinc-plated steel with vinyl insulator. They shall be **Watts Series B6080, NIBCO T585-70, Apollo 70-100 Series**, or approved equal.

D. **PVC Ball Valves** shall be full port opening with all wetted materials composed of Schedule 80 PVC. Valve shall have true union ends or flanged ends to mate with ANSI B16.5 Class 150 flanges. PVC ball valves shall be **NIBCO Chemtrol Series, Spears Mfg. Co. TU-2-2025**, or approved equal. PVC Ball valves are not allowed to be connected to any pump discharge piping.

2.3 SERVICE SADDLES

A. See City of West Jordan Standard Detail CW-105.

2.4 WATER SERVICE CONNECTIONS AND FITTINGS

A. Water service pipe shall be polyethylene tubing (PE 3408 IPS, 200 psi) for buried service lines. Poly piping shall be 3/4-inch, 1-inch or 2-inch minimum as indicated on the Contract Drawings. Replacement service pipes shall be the same diameter as existing pipes.

B. All water service connections, except 2-inch, shall be made using **Mueller Insta-Tite Connections, Ford Ultra-Tite**, or approved equal, fittings and shall conform to AWWA C800. All 2-inch water service connections shall be made using **Mueller Pack Joint, Ford Pack Joint**, or approved equal.

C. If the existing service is poly pipe, a coupling can be used to extend the poly service to the new waterline.

D. New water service lines shall be bored, jacked or augered under the existing pavement, gutters or sidewalks.

E. Where the new service line will pass under an existing gas line, in order to prevent damage, the gas line shall be potholed and shall remain exposed until the service line is installed.

2.5 CORP STOPS

A. Corp Stops shall be Brass Alloy 85-5-5-5 ASTM B62 and conform to the requirements of AWWA C800.

B. Corp Stops for 3/4-inch and 1-inch sizes shall be **Mueller H-15026, Ford F1100 Ultra-Tite joint**, or approved equal.

C. Corp Stops for 2-inch size shall be **Mueller E-25029, Ford F1100 Pack Joint**, or approved equal.

2.6 FIRE HYDRANTS

A. Fire hydrants shall the dry-barrel type that meet or exceed ANSI/AWWA C502, latest revision. Rated working pressure shall be 250 psig, test pressure shall be 500 psig.

B. The nozzle section, upper and lower stand pipes and hydrant base shall be ductile iron.

C. External surfaces above grade shall be factory coated with an epoxy primer and a two-part polyurethane top coating.

D. The main valve closure shall be of the compression type, opening against the pressure and closing with the pressure. Nozzle section to be designed for easy 360° rotation by the loosening of no more than four bolts.

E. The valve opening diameter shall be 5-1/4”. Hydrant must be designed so that removal of all working parts can be accomplished without excavating. The bronze seat shall be threaded into mating threads of bronze for easy field repair.

F. Bolting below-grade shall be stainless steel.

G. The draining system of the hydrant shall be bronze and be positively activated by the main operating rod. Hydrant to be furnished with a sliding bronze drain valve. Sliding drain valves made of rubber, plastic or leather will not be allowed.

H. Hydrant must have an internal travel stop nut located in the top housing of the hydrant.

I. Hydrant operating threads to be factory lubricated. O-rings shall be furnished to help keep operating threads lubricated and protected from line fluid and from the weather.

J. Hydrant must have a traffic flange design allowing for quick and economical repair of damage resulting from a vehicle's impact. Hydrants shall be **AMERICAN Flow Control's Waterous Pacer Model WB67-250** (NO EQUAL ALLOWED).

2.7 VALVE BOXES AND LIDS

A. All buried valves shall be installed complete with 6-inch diameter slide type, two-piece cast iron valve box. Manufacturer be **Tyler 562 Series**, or approved equal. The valve box lid shall be designated "WATER" unless noted otherwise on the Contract Drawings.

B. Concrete Collars shall be 10" thick x 2'- 6" in diameter centered on the valve box. They shall have two circumscribing #4 bars, one at three inches from the outside edge and a second bar nine inches from the outside edge each centered in the concrete. Concrete shall be 3000 psi.

2.8 PRESSURE GAUGES

A. Pressure gauges shall be provided where shown on the drawings. Gauges shall meet the requirements of ASME B40.1 Grade 2A and be industrial type with stainless steel movement, liquid filled, and stainless steel, Polypropylene, or Phenolic case. Gauges shall have a rear blowout disc or panel. Unless noted otherwise on the drawings, pressure gauges shall have a 4-1/2-inch dial with white face and black lettering, a ½-inch threaded connection, and shut-off valve. Measuring element shall be a stainless steel Bourdon Tube. Gauges shall be calibrated to read in applicable units, with an accuracy of ± 0.5 percent to 150 percent of the working pressure. Gauges shall be manufactured be **Ashcroft Model 1279 Duragauge, 1900 Series SOLFRUNT by Ametek (U.S. Gauge), Process Gauge by Marsh Bellofram**, or approved equal.

B. Pressure gauges that connect to lines other than potable water shall have gauge guards to prevent corrosion and clogging. Gauge guards shall have a durable flexible diaphragm which serves as a protective barrier between the process fluid and instrument. The diaphragm shall be either elastomer or Teflon and rated for the pressure of the gauge.

C. Pressure gauges for chemical service lines shall be 2-1/2-inch diameter with integral diaphragm seal. These gauges shall be manufactured by **Plast-o-matic**, or approved equal.

2.9 BOOSTER PUMP CONTROL VALVES

A. Booster Pump Control Valves shall be designed to eliminate starting and stopping surges caused by the pump. The valve shall be equipped with a built in check valve. The valve shall be hydraulically operated, single diaphragm actuated, globe type valve. Valve stem shall be stainless steel and the valve body shall be steel conforming to ASTM A 216, Grade WCB. Flanges shall be Class 150 and shall be rated for a working pressure of 350 psi. The valve manufacturer shall provide a 3 year warranty on the valve and 1 year warranty on the electrical components. The booster pump control valves shall be **Model 61-02 by Cla-Val Company**, or approved equal.

B. The booster pump control valve shall be controlled by an externally mounted pilot control system with a four-way solenoid operated pilot. The solenoid shall be designed to operate on 120 Volt AC current and have a manual operator installed. The pilot system shall include a four-way solenoid pilot valve, opening and closing speed controls, shut off valves, strainers, and CVS-1 shuttle valve to provide the highest available operating pressure to the pilot system.

C. The booster pump control valve shall have an adjustable limit switch assembly mounted on the main valve and connected to the main valve stem. It shall be actuated by opening or closing of the valve and easily adjusted to operate at any point of the valve's travel. The limit switch shall be used to complete the pump off cycle. The actuating point of the limit switch shall be adjustable.

D. A direct factory representative shall provide start-up assistance, inspection and adjustments. The representative shall provide 2 to 4 hours of assistance for each valve installed on the project.

2.10 PRESSURE REDUCING VALVES

A. Pressure reducing valves 1/2-inch to 2-1/2-inch shall have a bronze ASTM B62 body and cover with stainless steel trim. Diaphragm shall be reinforced EPDM and the disc EPDM. Valves shall be balanced, direct acting type **Model 990 by Cla-Val Co.**, or approved equal. Valves shall be installed at the location(s) shown on the drawings. The pressure class shall be 150 lb, and the valve shall be set to operate at the pressure indicated on the drawings.

B. Pressure reducing valves 1/8-inch to 1/4-inch shall be brass with stainless steel stem and spring. Valves shall be provided with a gauge and be **Model #560G by Watts**, or approved equal. Valves shall be installed at the location shown on the drawings. The valve shall be set to operate at the pressure indicated on the drawings.

2.11 SURGE SUPPRESSION SWING CHECK VALVE

A. The check valve shall be of the full flow body type, with a domed access cover and only two moving parts, the flexible disc and the Disc Accelerator. Valves 2" through 12" diameter shall be suitable for pressures up to 250 psi water service and valves 14" through 66" shall be suitable for up to 500 psi water service.

B. The valve shall be designed, manufactured, and tested in accordance with AWWA C 508. Valves used in potable water service shall be certified to NSF/ANSI 61 Drinking Water System Components – Health Effects, and certified to be Lead-Free in accordance with NSF/ANSI 372.

C. The valve shall be certified to be lead free in accordance with NSF 61, Annex G.

D. Joints: Provide the type of joint as specified on the Contract Drawings. Unless noted otherwise, provide wafer style valves for installation between ANSI B16.1 Class 125 flanges. Grooved end valves shall be provided in 2" through 12" diameters for installation on pipe with cut grooves per AWWA C606 for steel IPS pipe.

E. Materials: The valve body and cover shall be constructed of ASTM A536 Grade 65-45-12 ductile iron or ASTM A126 class B gray iron for 30 in. (800mm) and larger. Optional

body materials include ASTM A-351 Grade CF8M, stainless steel for sizes 3” (80 mm) through 12” (300 mm). The disc shall be precision molded Buna-N (NBR), ASTM D2000-BG. Optional disc material includes Viton, EPDM, Hypalon. The disc accelerator shall be Type 302 stainless steel.

F. Valve interior and exterior shall be coated with an NSF 61 certified fusion bonded epoxy in accordance with AWWA C 550.

G. Swing check valves shall be **SURGEBUSTER by Val-Matic,** or approved equal.

2.12 DRAIN LINE CHECK VALVE

A. Drain line check valves shall be the low-head “duck bill” type installed at the locations shown on the drawings. Valves shall be constructed of pure gum rubber and be **Tideflex Model TF-1 by Red Valve**, (no approved equal).

2.13 CHECK VALVES

A. The globe style check valves shall be **APCO Globe Style Series 600 Silent Check Valves**, or approved equal, and shall be rated at 150 psi.

B. The 1-inch and 2-inch brass check valves shall be **Watts CVY Series**, or approved equal, with rating 125 WSP/200 WOG.

C. The 1-inch PVC check valves shall be **Spears Industrial Ball Check Valve Model 4521**, or approved equal, with a pressure rating of 235 psi.

2.14 HOSE BIBBS and SAMPLING TAPS

A. Hose bibbs shall be as-manufactured by Watts, or approved equal, and shall include an integral vacuum breaker or built-in backflow protection devices and cast iron wheel handle. Sampling Taps shall be smooth nose type. Valves shall be stainless steel.

2.15 COMBINATION AIR/VACUUM VALVES

A. Combination Air/Vacuum valves shall be single body, double orifice valves conforming to the requirements of AWWA C 512. Valve float shall be stainless steel. Valves shall be the size indicated on the drawings and shall be **Series 140C by APCO (DeZURIK)**, or approved equal.

2.16 DEEP WELL AIR RELEASE VALVES

A. Well Service Air Valves shall be fully automatic float operated valves designed to exhaust air which is present in the pump column on pump startup and allow air to re-enter the column on pump shutdown or should a negative pressure occur. Valve shall be equipped with a dual port throttling device shall provide adjustable control of the exhaust rate and allow free flow into the valve through a separate inlet port. Valve shall be equipped with a air release valve (5/32” orifice) which shall be connected externally via the main valve body. All valve floats shall be Type 316 stainless steel and valves shall be NSF 61 listed. Valves shall be the size indicated on the drawings and shall be **Series 140 (Model 144DAT) by APCO (DeZURIK),** or approved equal.

2.17 FLOW METER

A. See Section 40 91 23 – Miscellaneous Properties Measurement Devices.

2.18 PRESSURE TRANSMITTERS

A. See Section 40 91 23 – Miscellaneous Properties Measurement Devices.

PART 3 EXECUTION

3.1 INSTALLATION

A. Valves, valve-operating units, stem extensions and other accessories shall be installed by CONTRACTOR where shown, or where required in the opinion of ENGINEER, to provide for convenience in operation. Where buried valves are indicated, CONTRACTOR shall furnish and install valve boxes at grade with concrete collars. All valves and boxes shall be new and recently manufactured.

B. Install mechanical appurtenances as indicated on the plans and in accordance with the manufacturer's written instructions.

- END OF SECTION -

SECTION 33 21 25
WIRELINE LOGGING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section covers professional wireline services for geophysical borehole logging.

B. The set of logs required at each step of the well construction process will be determined by the ENGINEER/GEOLOGIST.

C. Caliper logs are required at the completion of each drilled section to verify proper casing fit and to determine the volume of the annulus for grouting, bentonite and filter pack installation.

D. Unless stated otherwise, the standard e-log suite is required in all pilot holes drilled.

E. All geophysical logging is to be performed by a professional service provider specializing in geophysical logging. If any log is performed by the CONTRACTOR, documentation will be required for proof of qualifications and approval by the ENGINEER/GEOLOGIST.

1.2 WIRELINE LOGS

A. The following is a standard list of typical wireline logs used to identify the physical properties of a well.

1. Geophysical Logs
   a. Caliper Log*
   b. Natural Gamma Ray (Gamma Log)*
   c. Normal Resistivity (8”,16” and 64”)*
   d. Spontaneous Potential (SP)*
   e. Temperature*
2. Alignment Logs
   a. Gyroscopic
   b. Dummy/Cylindrical Plummet
3. Video

* Well logs constituting a standard e-log suite

PART 2 MATERIALS

2.1 WIRELINE LOGGING

A. Prior to setting up over the hole, all equipment that may contact the interior of a hole, or that may contact other equipment that will enter the hole shall be thoroughly cleaned or otherwise disinfected. At the drill site, cleaned equipment shall be kept off the ground.

2.2 ALIGNMENT LOGS

A. Alignment Logs are to be of sufficient length and diameter to effectively perform the plumbness and alignment test. The cylindrical plummet or dummy tool is to be a

minimum of 0.5 inches smaller than the smallest diameter construction of the screens to ensure proper fit.

2.3 VIDEO LOGS

A. Cameras are to provide both downhole and side-looking views with sufficient quality (resolution and color) to interpret and verify the construction of the well.

B. Recording equipment shall be capable of providing digital copies of the video log(s) including redundancy of the well video in case the files become damaged or corrupted.

PART 3 EXECUTION

3.1 SETUP AND CALIBRATION

A. Geophysical Logs

1. All wireline logs are to be run centralized (unless specifically stated otherwise) within the hole and physical properties recorded from the bottom of the well to the surface.
2. All depths and hole measurements (including hole size, casing diameters, casing lengths and total depth) are to be verified and recorded independent of any measurements communicated from the driller.
3. All logs shall use the common datum below ground surface (bgs).
4. All logs shall be properly calibrated to the size of the hole, where applicable.
5. All logging is to be witnessed and verified by the onsite ENGINEER/GEOLOGIST.

B. Alignment Logs

1. Gyroscopic logs are to be run centralized within the hole and physical properties recorded from the bottom of the well to the surface.
2. Cylindrical Plummet (Dummy tool) is to be built according to the following specifications:
3. The full diameter of the tool is to be 0.5 inches smaller than the inside diameter of the screens (this includes accounting for restricted areas due to rods from wire-wrap screens and/or welds).
4. The length of the tool is approximately 1.25 inches multiplied by the inside diameter of the casing.
5. At a minimum, the tool will be built with a rigid spindle and truly round plate at each end. The tool will be lowered by a wireline in the exact center of the top plate.
6. The Apex will be recorded and set at a minimum of 10 feet above the ground surface.

C. Video Logs

1. The CONTRACTOR shall perform a video survey to verify contract compliance.
2. A written log of the well construction including all relevant depths is to be recorded by the video logger.
3. All welds, joints or other material transitions are to be viewed from the side with a full 360-degree view.
4. Well casing is to be video logged sufficiently to verify perforation success and uniformity.

5. Video logs shall verify total depth of the well and record any fill that has accumulated in the bottom.

3.2 DELIVERABLES

A. Geophysical Logs

1. At a minimum, 3 physical copies of the well logs shall be provided upon completion of the well logging run. One copy for each respective party (CONTRACTOR, OWNER, ENGINEER/GEOLOGIST).
2. Electronic copies (LAS, PDF, TIFF), including any interpretations are to be emailed to the same respective parties.

B. Alignment Logs

1. Detailed specifications of the Cylindrical Plummet will be provided to the ENGINEER/GEOLOGIST before the test is performed.
2. Deflection of the plummet shall be recorded at the surface in two planes set 90 degrees apart.
3. Deflection measurements are to be recorded in 10 foot intervals or as deemed appropriate by the ENGINEER/GEOLOGIST.

C. Video Logs

1. All Video Logs are to be provided in digital format or transferred electronically.
2. Written comments regarding any observations made by the video logger.
3. Two copies shall be provided to the OWNER.

- END OF SECTION -

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SECTION 46 36 53
CALCIUM HYPOCHLORITE TABLET CHLORINATION SYSTEM

PART 1 GENERAL

1.1 GENERAL DESCRIPTION

A. The system shall be designed to feed low concentrations of calcium hypochlorite in solution intermittently or continuously as required for addition of chlorine to water from a drinking water well. The system shall be a single pre-assembled, package unit in a welded aluminum frame consisting of chlorinator, electrical boxes, centrifugal pump, and balance tank for ease of installation and operation. Field assembled systems shall not be acceptable. The system shall be the PowerPro® Model 3012 by AXIALL, LLC. Only NSF Standard 60 listed Accu-Tab® SI (scale inhibitor) calcium hypochlorite tablets by AXIALL, LLC shall be used.

B. Any system offered shall use an NSF Standard 61 listed erosion feeder and an NSF Standard 60 listed calcium hypochlorite tablet.

1.2 SYSTEM FEATURES

A. A maximum chlorine solution level of 0.05% (500 ppm) shall be maintained to prevent calcification in system components.

B. Delivery shall be by erosion feed technology to control accurate and consistent concentration limits in the chlorine treatment solution.

C. The chlorinator shall automatically and continuously feed a limited quantity of chlorine in solution as needed; when the system is not running, no more chlorine than that amount which can be fed in one minute or less shall be left in the tank to prevent chlorine loss.

D. A centrifugal pump wired to the system electrical box shall feed freshly mixed chlorine treatment solution only as required for maximum efficiency.

E. All piping in the chlorinator unit shall be Schedule 80 PVC for durability.

1.3 WARRANTY

A. The manufacturer shall guarantee in writing that this unit, if operated in accordance with written instructions given and accepted by the Owner, will perform in complete accord with the specifications. All components will be warranted against manufacturers' defects for twelve (12) months from its original installation date or thirteen (13) months from its AXIALL shipment date, whichever first occurs. Only Accu-Tab® SI tablets can be used in these chlorination systems.

PART 2 PRODUCTS

2.1 SYSTEM COMPONENTS

A. *Tablet Chlorinator*. Accu-Tab® chlorinators by AXIALL, LLC are designed exclusively for Accu-Tab® SI calcium hypochlorite tablets by AXIALL, LLC. Tablets are placed on a sieve plate inside the chlorinator; as water flows across the sieve plate, the tablets erode at a rate proportional to the flow rate.

B. Inlet Water Supply Connection with Filter.

Model 3012 1” FNPT (fresh water supply of 15 GPM required)

C. *Inlet Solenoid Valve*. Opens and closes on command when the system receives a signal.

D. *Flow Control Valve*. PVC gate valve mounted in line with the flow meter allows operator to adjust flow of water-dissolving stream.

E. Solution Tank. Made of medium-density polyethylene. Capacities:

Model 3012 22 gallons

F. *Primary Solution Tank Level Control*. Made from PVC and 316L stainless steel, this float valve meters the tablet by-pass flow. The by-pass stream balances the variation in the water-dissolving stream. The float valve opens or closes to maintain the pump rate as it is manually throttled.

G. *Secondary High/Low Level Solution Tank Control*. Prevents the solution tank from overflowing. High level: when activated, a switch opens the circuit to the solenoid valve, causing the valve to close. Low level: shuts pump down preventing cavitation. A restart timer prevents the pump from “chattering”.

H. *Solution Delivery Pump*. Delivers chlorinated solution into a pressurized stream. A Grundfos vertical multi-stage centrifugal pump shall be included with the capacity of producing 125 psi.

I. *Solution Injection Pump Air Bleed*. Used to prime the pump at start-up, or at any time, if necessary. Also functions as a recycle line for tank cleaning.

J. *Primary Backflow Prevention*. A PVC Ball check valve prevents reverse flow of water into the system.

K. *Discharge Control Valve* (manual). Used to balance system output water flow with system input water flow.

L. *Outlet Connection*.

Model 3012	1” FNPT

M. *NEMA 4X Electrical Enclosures, UL listed*.

N. *Aluminum Frame*: Type 6061-T.

O. *Inlet Pressure Regulator.* Schedule 80 PVC pressure regulator installed for water inlet pressure above 70 PSIG.

P. *Inlet Pressure Gauge.* Gauge reading 0 to 250 PSIG installed for inlet pressure above 70 PSIG.

Q. *Control Option.* A variable frequency drive (VFD) motor on the solution delivery pump is controlled by the process controller. Capability to control in Flow-Pacing, Residual, or Compound Loop modes shall be provided.

R. *Weight Scale.* Load cell factory-installed under the chlorinator to measure tablet weight.

2.2 ELECTRICAL REQUIREMENTS

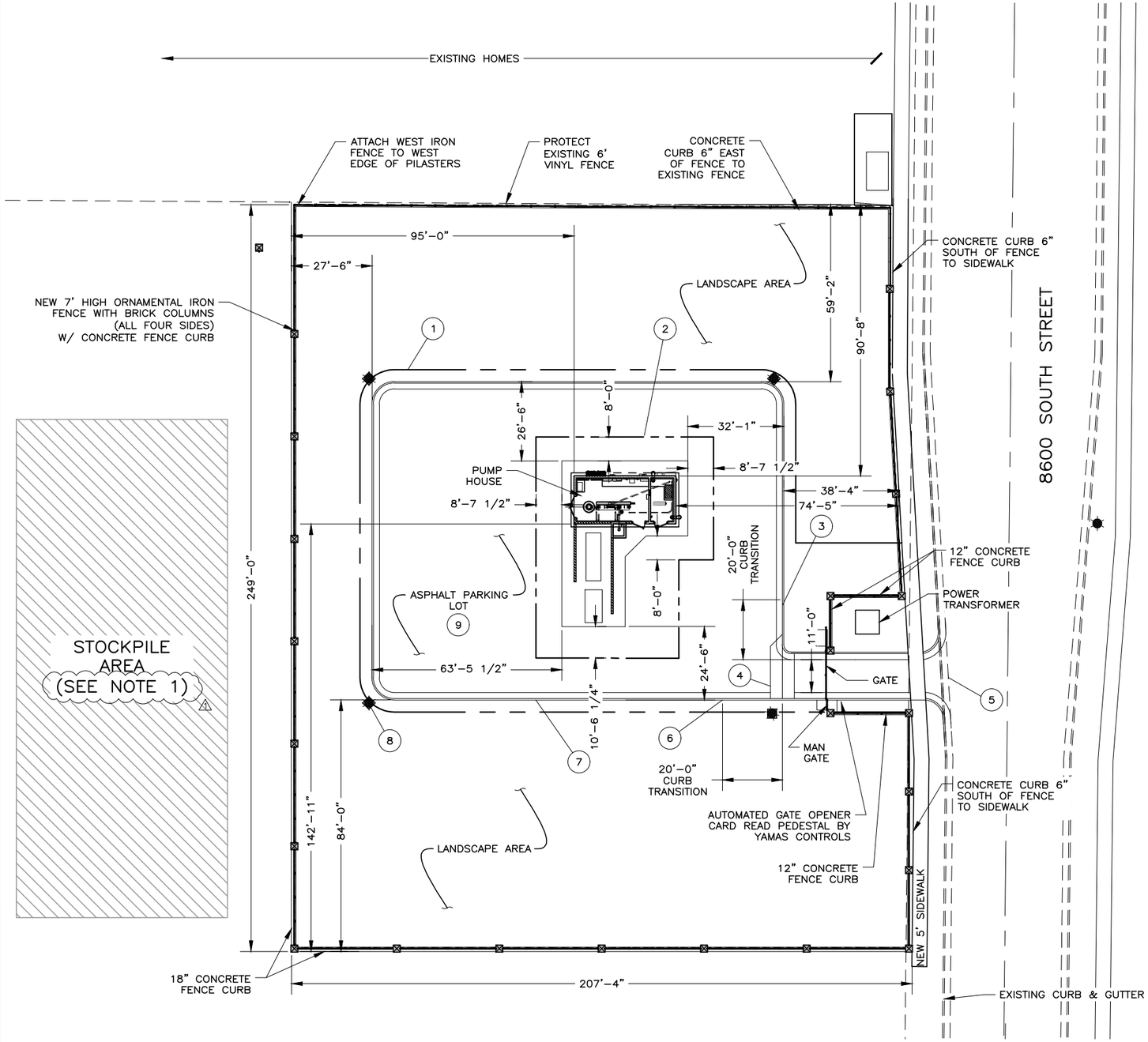
A. Each system to be designed per available power. The control panel shall operate on 120V, 1-phase power. The unit shall receive a 4-20 mA pacing signal for chlorine dosing.

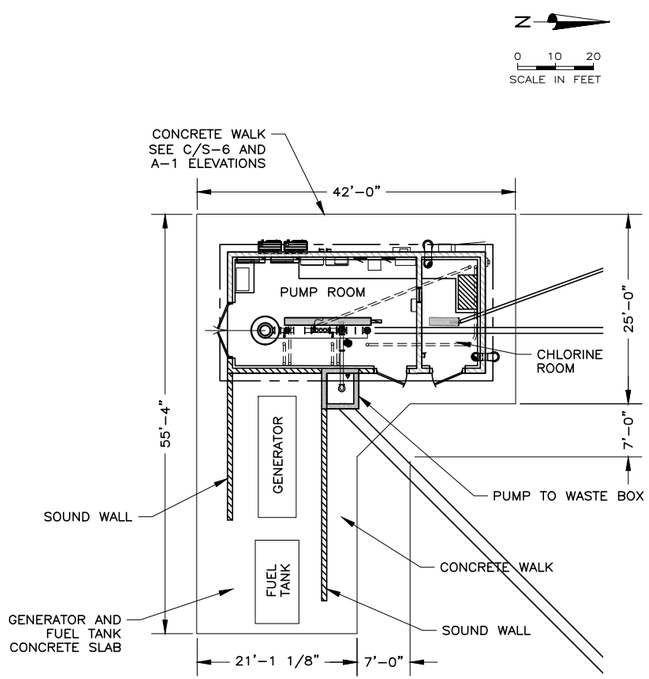
B. The control panel shall provide the following relay contacts for remote monitoring and control:

1. Chlorinator Remote Run
2. Pump Running
3. Solution Tank High Level
4. Solution Tank Low Level
5. System Flow
6. Weight Scale Alarm

PART 3 EXECUTION (Not Used)

- END OF SECTION -





NOTE: MAINTAIN 3' MINIMUM CLEARANCE AROUND GENERATOR AND FUEL TANK

PUMP HOUSE PLAN VIEW

SCALE: 1:10

1. LIMITS OF SHALLOW SITE OVER-EXCAVATION AND FILL REQUIREMENTS 4'-0" BEYOND CURB LINE AND OTHER MARKED AREAS (SEE GEOTECHNICAL REQUIREMENTS ON SHEET S-1B)
2. LIMITS OF DEEP SITE OVER-EXCAVATION AND FILL REQUIREMENTS (SEE GEOTECHNICAL REQUIREMENTS ON SHEET S-1B)
3. TRANSITION TO APWA PLAN 205. TYPE E TO NORTH
4. APWA PLAN 211 8' WATERWAY
5. REMOVE EXISTING CURB AND GUTTER AND REPLACE TO MATCH SURROUNDING PER WJ CITY STD DRAWING RD100 & RD200
6. TRANSITION TO APWA PLAN 205.2 TYPE E TO NORTH
7. APWA PLAN 205.2 TYPE H CURB & GUTTER
8. PARKING LOT LIGHT MOUNTED ON CONCRETE PEDESTAL (TYP OF 4)
9. 3" OF AC PAVEMENT OVER 6" OF UBC

SHEET NOTE:
1. DUE TO ADJACENT CONCURRENT CONSTRUCTION PROJECTS, THE STOCKPILE AREA SHOWN MAY NOT BE AVAILABLE. CONTRACTOR IS RESPONSIBLE TO COORDINATE AND GET APPROVAL FOR AN APPROPRIATE STOCKPILE AREA FROM THE CITY AND ADJACENT PROJECT'S CONTRACTOR OR REMAIN WITHIN THE WELL #8 PROJECT LIMITS.

FILE NAME: PROJECTS\089 - WEST JORDAN\29.100 - WELL NO. 8 PUMP BUILDING\CAD\C-1A SITE PLAN.DWG
FILE DATE: 4.4.2024 16:34:51 (DCL)

HANSEN ALLEN & LUCE inc ENGINEERS

LICENSED PROFESSIONAL ENGINEER # 260247 Delmas W. Johnson STATE OF UTAH
PROJECT ENGINEER

DESIGNED	MGA	3				
DRAFTED	BKC & DCL	2				
CHECKED	MEA	1	09/16/25	ADDENDUM #2	ABO	DWJ
DATE	APRIL 2024	NO.	DATE	REVISIONS	BY	APVD.

SCALE: AS SHOWN

WEST JORDAN UTAH

WELL NUMBER 8 PUMP BUILDING
CIVIL
PUMP HOUSE SITE PLAN

SHEET C-1A

089.29.100

7/04

N

0 20 40
SCALE IN FEET

EXISTING HOMES

EXISTING ROCKY MOUNTAIN POWER 3-PHASE SECTIONALIZER CABINET

WATER CONNECTION WITH METER, STOP & WASTE, AND BACKFLOW PREVENTION VALVE — CW-105 / C-10

CW-120 / C-10

4" PVC DRAIN TO SEWER

SEWER MANHOLE (SEE PP-2)

CONNECT NEW 4" SEWER DRAIN PIPE TO EXISTING 15-INCH SEWER. — SS-025 / C-11

8" DIP OUTLET WATERLINE (SEE PP-1)

CONNECT NEW 8" DIP WATERLINE TO EXISTING PVC WATERLINE W/ 8" TEE & THREE GATE VALVE.

STOCKPILE AREA (SEE NOTE 1) ⚠1

8' WIDE CONCRETE WATER WAY

COMBINATION INLET BOX (SEE SD-14 ON C-11)

15" PVC DRAIN PIPE (SEE PP-3)

NEW COMBINATION INLET BOX (SEE SD-14 ON C-11)

8600 SOUTH STREET

CONNECTION TO EXISTING STORM DRAIN CLEANOUT BOX — SD-14 / C-11

18" RCP DRAIN PIPE, TRENCH & ASPHALT RESTORE PER WJ STD DETAIL SD-02 & RD-175, SEE SHEETS C-12 & C-13

EXISTING HOMES

SHEET NOTE:
1. DUE TO ADJACENT CONCURRENT CONSTRUCTION PROJECTS, THE STOCKPILE AREA SHOWN MAY NOT BE AVAILABLE. CONTRACTOR IS RESPONSIBLE TO COORDINATE AND GET APPROVAL FOR AN APPROPRIATE STOCKPILE AREA FROM THE CITY AND ADJACENT PROJECT'S CONTRACTOR OR REMAIN WITHIN THE WELL #8 PROJECT LIMITS. ⚠1

FILE NAME: PROJECTS\089 - WEST JORDAN\29.100 - WELL NO. 8 PUMP BUILDING\CAD\C-1B SITE PLAN UTILITIES.DWG
FILE DATE: 4.4.2024 16:36:38 (DCL)

HANSEN ALLEN & LUCE inc ENGINEERS

LICENSED PROFESSIONAL ENGINEER # 260247 Delmas W. Johnson STATE OF UTAH
PROJECT ENGINEER

DESIGNED	MGA	3			
DRAFTED	BKC & DCL	2			
CHECKED	MEA	1	09/16/25	ADDENDUM #2	ABO DWJ
DATE	APRIL 2024	NO.	DATE	REVISIONS	BY APVD.

SCALE AS SHOWN

WEST JORDAN UTAH

WELL NUMBER 8 PUMP BUILDING
CIVIL
PUMP HOUSE UTILITIES SITE PLAN

SHEET C-1B
089.29.100

7/04

FITTING SCHEDULE

ITEM NO.	DESCRIPTION	SIZE	MATERIAL	WALL THICKNESS	CONNECTION	FLANGE TYPE	COATING/LINING	NOTES
1	PUMP DISCHARGE HEAD	6"	STEEL	STD	FLG	CLASS D	SYSTEM NO. 1 / SYSTEM NO. 2	
2	PIPE, STRAIGHT NIPPLE	6"	STEEL	SCH 40	FLG x GRV			LENGTH VARIES, MIN. 10"
3	PIPE, STRAIGHT SPOOL	6"	STEEL	SCH 40	FLG	--		
4	TEE, REDUCING	6" x 6" x 4"	STEEL	SCH 40	FLG	WELD NECK	SYSTEM NO. 1 / SYSTEM NO. 1	
5	PIPE, STRAIGHT NIPPLE	4"	STEEL	SCH 40	FLG x GRV			WALL SPOOL WITH THRUST RING
6	COUPLING, FLEXIBLE, GROOVED	4"	DUCTILE IRON	--	GRV	--		VICTUALIC STYLE 177
7	PIPE, STRAIGHT SPOOL	4"	STEEL	SCH 40	FLG x FLG			
8	WELDOLET	1/2"	STEEL		WELD			
9	ELBOW, 90-DEG	4"	STEEL	SCH 40	FLG			
10	PIPE, STRAIGHT SPOOL	4"	STEEL	SCH 40	FLG x PE			
11	SUPPORT, ADJUSTABLE, FLANGE SUPPORT	6"	STEEL	-	-	-		B-LINE B3094, W/ B3089 & B3088T. DETAIL B ON C-9
12	TEE, REDUCING	8" x 8" x 6"	STEEL	SCH 40	FLG	WELD NECK	SYSTEM NO. 1 / SYSTEM NO. 1	
13	PIPE, STRAIGHT SPOOL	8"	DUCTILE IRON	CLASS 52	FLG			USE WAX TAPE COATING SYSTEM FOR BURIED FLANGES
14	ELBOW, 90-DEG	8"	DUCTILE IRON	CLASS 52	FLG			
15	WELDOLET	1"	STEEL	-	WELD			
16	HEAVY WALL PVC HOSE	1"	PVC					KURI TEC K3130 SERIES BF
17	SLEEVE FOR CHLORINE SOLUTIONS	3"	PVC	SCH 80	WELD			
18	HEAVY WALL PVC HOSE	1"	REINFORCED PVC					KURI TEC K3130 SERIES BF
19	SLEEVE FOR SAMPLE LINES	2"	PVC	SCH 80	WELD			
20	HEAVY WALL PVC HOSE	1/2"	REINFORCED PVC					KURI TEC K3130 SERIES BF
21	FLOOR DRAIN	9"	CAST IRON					ZURN - Z508 EXTRA HEAVY DUTY DRAIN W 6" OUTLET PIPE
22	FLOOR DRAIN	6"	PVC	SCH 80	WELD			DETAIL C ON C-10
23	CHECK VALVE	6"	RUBBER		SLIP ON			TIDEFLEX TF-1 W STAINLESS CLAMPS
24	AIR GAP DRAIN	2"	PVC	SCH 80	WELD			DETAIL G ON C-8
25	DRAIN	2"	PVC	SCH 80	WELD			CONNECT TO TRENCH DRAIN
26	COUPLING, DISMANTLING JOINT	6"	STEEL/DUCTILE IRON	STD	FLG	AWWA C207 CLASS D	FBE	ROMAC DJ400
27	COUPLING, FLEXIBLE, GROOVED	6"	DUCTILE IRON	--	GRV	--		VICTUALIC STYLE 177

VALVE & EQUIPMENT SCHEDULE

ITEM NO.	DESCRIPTION	SIZE	MATERIAL	CLASS	CONNECTION	OPERATOR	MANUFACTURER	MODEL	NOTES
101.	DEEP WELL AIR VALVE ASSEMBLY	2"			THD		APCO DEZURIK	144DAT	W/ AIR RELEASE VALVE
102.	AIR VALVE ASSEMBLY	1"			THD		APCO DEZURIK	140C	
103.	CHLORINE INJECTION QUILL	1/2"	316 STAINLESS				KOFLO	QS-.5-3	ROUTE HOSE THROUGH TRENCH
104.	CHLORINE INJECTION WELDOLET CONNECTION	1/2"	316 STAINLESS		HOSE X THD				1 1/2" x 1/2" REDUCER
105.	MAGNETIC FLOW METER	6"	STAINLESS STEEL	STD (150 PSI)	FLG		ENDRESS & HAUSER	PRO MAG W 400	
106.	STATIC MIXER	6"	STAINLESS STEEL		GRV		STATIFLOW	SERIES 600	2 ELEMENTS (1.5:1 PITCH RATIO) CONFIRM LAY LENGTH
107.	GATE VALVE	4"	DUCTILE IRON	STD (350 PSI)	FLG	HANDWHEEL	MUELLER	A-2361	W/ POSITION INDICATOR
108.	PUMP CONTROL VALVE	4"					CLAVAL	61-02	ANGLE STYLE
109.	CHECK VALVE, SHORT STROKE	6"	DUCTILE IRON	STD (250 PSI)	FLG		VAL-MATIC	SURGEBUSTER	W/ POSITION INDICATOR
110.	GATE VALVE	6"	DUCTILE IRON	STD (350 PSI)	FLG	HANDWHEEL	MUELLER	A-2361	W/ POSITION INDICATOR
111.	PUMP, SUBMERSIBLE, 600 GPM ⚠1	16"							
112.	TABLET CHLORINATOR	N/A							
113.	TURBIDIMETER	N/A		150 PSI			ATI	Q46/76	TO PROVIDE PIPING PER DETAILS B & E ON C-8
114.	CHLORINE ANALYZER	N/A		150 PSI			ATI	Q46/62-63	WITH pH SENSOR
115.	SAMPLE POINT OUTLET	1-1/2"	WELDED STEEL		WELD X THD				LOCATION PER PLAN PER DETAIL D ON C-8

SHEET NOTES:

1. ALL FLANGES SHALL BE CLASS 125/150.

FILE NAME: PROJECTS\089 — WEST JORDAN\29.100 — WELL NO. 8 PUMP BUILDING\CAD\C-6 FITTINGS AND SCHEDULES.DWG
FILE DATE: 4.4.2024 16:45:56 (DCL)

7/04

HANSEN ALLEN & LUCE Inc ENGINEERS

LICENSED PROFESSIONAL ENGINEER # 260247 Delmas W. Johnson STATE OF UTAH
PROJECT ENGINEER

DESIGNED MGA	3					
DRAFTED BKC	2					
CHECKED MEA	1	09/16/25	ADDENDUM #2 (OIL LUBE RESERVOIR REMOVED)	ABO	DWJ	
DATE APRIL 2024	NO.	DATE	REVISIONS	BY	APVD.	

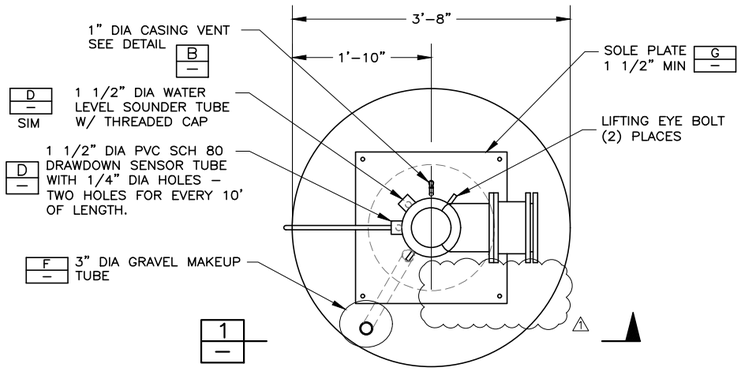
SCALE: AS SHOWN

WEST JORDAN UTAH

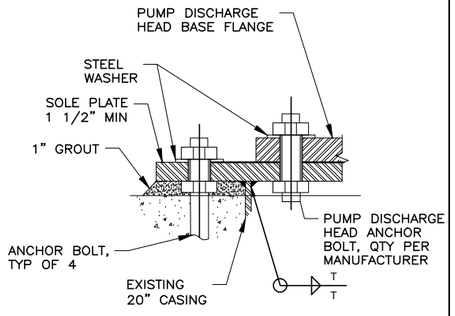
WELL NUMBER 8 PUMP BUILDING
CIVIL
PIPE FITTING AND EQUIPMENT SCHEDULE

SHEET C-6

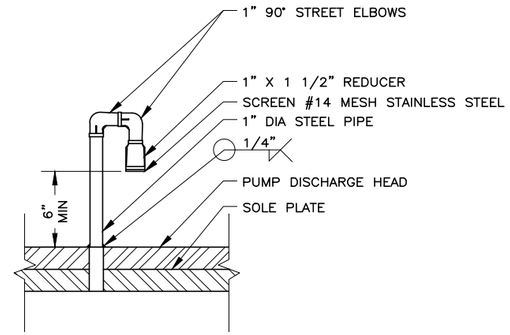
089.29.100



DETAIL A — NTS

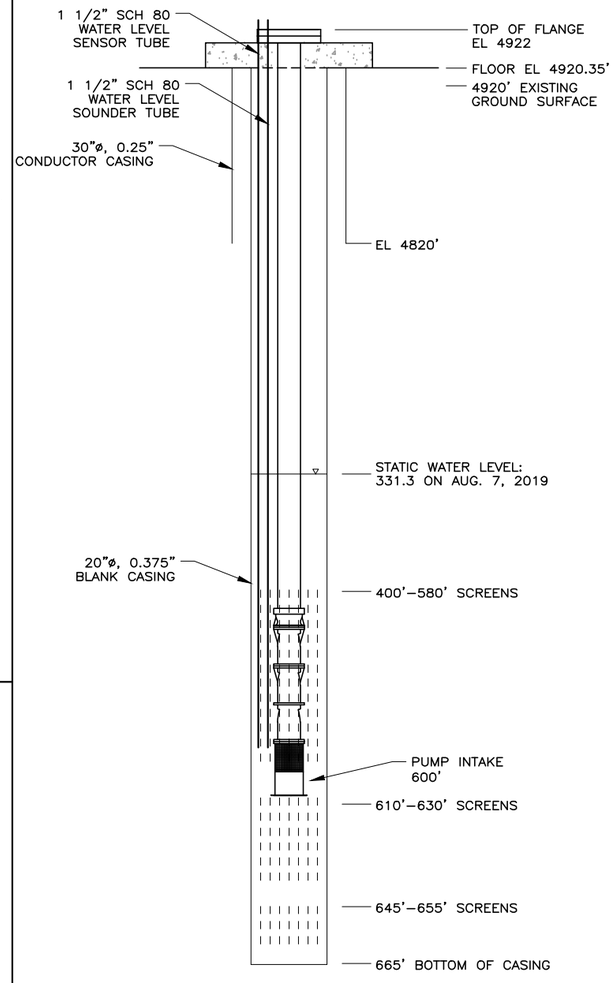


SOLE PLATE DETAIL G — NTS



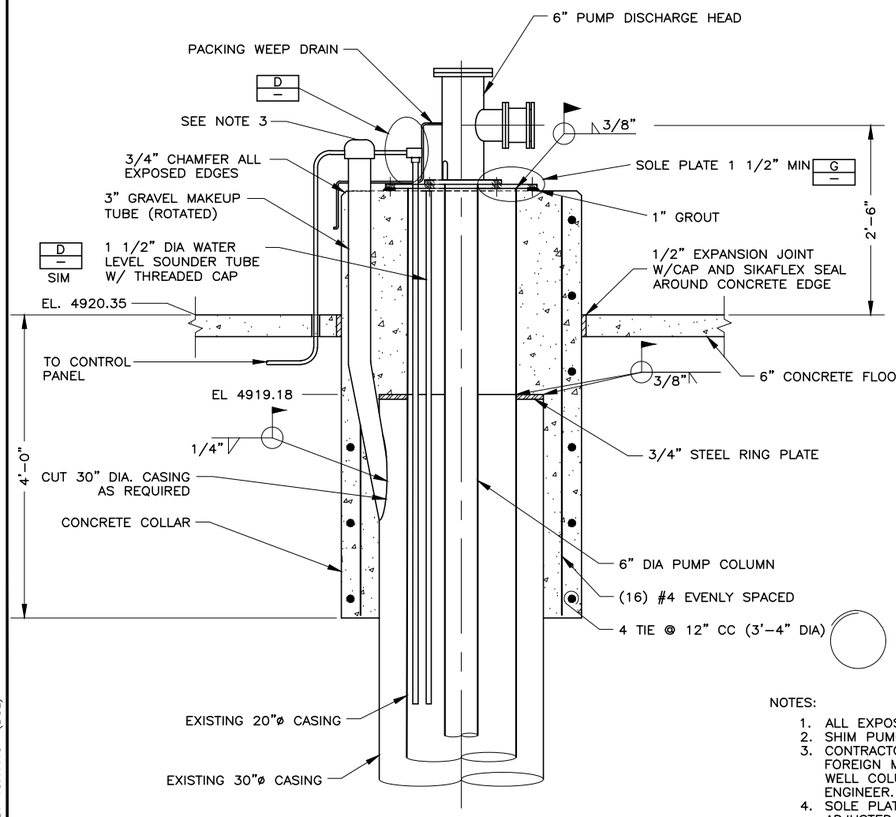
WELL CASING VENT DETAIL B — NTS

NOTE:
USE 316 STAINLESS STEEL PIPE AND FITTINGS FOR THE AIR VENT.



WELL PUMP DETAIL E — NTS — A C-4

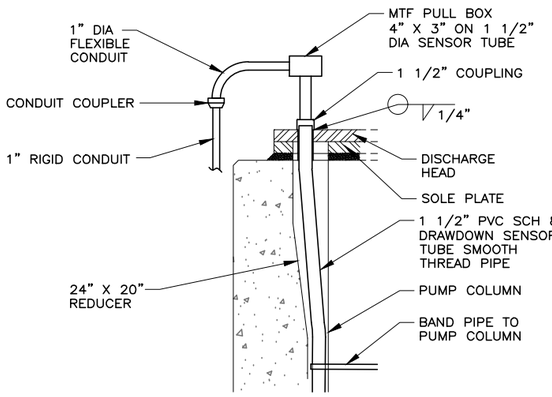
NOTE:
1. DEPTHS SHOWN ARE ESTIMATED BELOW EXISTING GRADE.



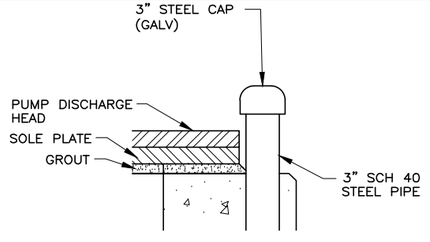
SECTION 1 — —

WELLHEAD DETAIL A — NTS — A C-4

NOTES:
1. ALL EXPOSED STEEL TO BE PAINTED.
2. SHIM PUMP FOR PROPER ALIGNMENT.
3. CONTRACTOR SHALL NOT INTRODUCE ANY FOREIGN MATERIAL OR CHEMICAL INTO WELL COLUMN WITHOUT APPROVAL OF ENGINEER.
4. SOLE PLATE ELEVATION SHALL BE ADJUSTED TO MATCH DIMENSIONS OF SUPPLIED DISCHARGE HEAD.
5. PUMP DISCHARGE HEAD & SOLE PLATE SHALL BE DESIGNED BY CONTRACTOR FOR ALL LOADS AND PENETRATIONS.
6. BAND DRAWDOWN SENSOR TUBE TO PUMP COLUMN USING STAINLESS STEEL BANDS AT 10' CENTER TO CENTER.



WELL LEVEL TRANSDUCER DETAIL D — NTS



GRAVEL MAKEUP TUBE DETAIL F — NTS

FILE NAME: PROJECTS\089 - WEST JORDAN\29.100 - WELL NO. 8 PUMP BUILDING\CAD\C-7 PUMP DETAILS.DWG
FILE DATE: 4.4.2024 16:47:19 (DCL)

HANSEN ALLEN & LUCE Inc ENGINEERS

LICENSED PROFESSIONAL ENGINEER # 260247 Delmas W. Johnson STATE OF UTAH
PROJECT ENGINEER

DESIGNED	MGA	3				
DRAFTED	DCL	2				
CHECKED	MEA	1	09/16/25	ADDENDUM #2 (OIL LUBE RESERVOIR REMOVED)	ABO	DWJ
DATE	APRIL 2024	NO.	DATE	REVISIONS	BY	APVD.

SCALE

WEST JORDAN UTAH

WELL NUMBER 8 PUMP BUILDING
CIVIL
PUMP DETAILS

SHEET C-7
089.29.100

7/04