

**COWEN PUBLIC SERVICE DISTRICT
WEBSTER COUNTY, WEST VIRGINIA**

CONTRACT #1 – PHASE II: WATER SYSTEM REHABILITATION PROJECT

ADDENDUM #3

JANUARY 26, 2021

THRASHER PROJECT # 010-0856

TO WHOM IT MAY CONCERN:

The following are clarifications and responses to questions posed by contractors for the above reference project.

A. GENERAL

1. Bid Opening for Contract #1 has been rescheduled to **2:00 p.m. on Tuesday, FEBRUARY 2, 2021.**
2. Bids will be received by the Cowen Public Service District, located at 7017 Webster Road, Cowen, West Virginia 26206. Bids shall be mailed, or hand delivered by **2:00 p.m. on Tuesday, February 2, 2021.** Social distancing guidelines will be followed. Conference call information is as follows: Call in number 1-646-558-8656; Meeting ID: 854-8803-2955; Passcode: 773709; and at the following address:

<https://us02web.zoom.us/j/85488032955?pwd=SXBDZ0VicC8xV2J1dElqRytqOExCZz09>

B. SPECIFICATIONS

1. **REPLACE** Section 221123.13 – Pressure/Booster Pump Station included with this Addendum #3.

C. DRAWINGS

1. **REPLACE** Sheet BS-2 included with this Addendum #3.

D. QUESTIONS AND RESPONSES

1. QUESTION

What is required from Article 6 – Bonds and Insurance, Part 6.05 Property Insurance of Specification Section C-700, Standard General Conditions?

RESPONSE

Builders Risk Insurance is not required.

E. CLARIFICATIONS

1. American Iron and Steel (AIS) requirements DO apply to this project.
2. Davis Bacon wage rates apply to this project.
3. Bidders are hereby notified to acknowledge receipt of all addenda in space provided.

If you have any questions or comments, please feel free to contact me at your earliest convenience. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.


Jonathan Carpenter, P.E.
Principal

SECTION 221123.13 – PRESSURE/BOOSTER PUMP STATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vertical Inline Multi-Stage Centrifugal Pumps
2. Controls

B. SCOPE OF WORK

1. Contractor shall furnish and install two (2) inline centrifugal pumps in the Nursing Home Booster Station and controls with a handoff, automatic alternator.
2. Contractor shall furnish and install one (1) inline centrifugal pump in the Bolair Booster Station.

1.2 REFERENCE STANDARDS

A. The work in this section is subject to the requirements of applicable portions of the following standards:

1. Hydraulic Institute
2. ANSI – American National Standards Institute
3. ASTM – American Society for Testing and Materials
4. IEEE – Institute of Electrical and Electronics Engineers
5. NEMA – National Electrical Manufacturers Association
6. NEC – National Electric Code
7. ISO – International Standards Organization

1.3 ACTION SUBMITTALS

A. The equipment submittal shall have a cover sheet with the name of the project and the equipment manufacturer's representative and contact information.

B. Submittals shall include the following:

1. Pump Performance Curves
2. Pump Outline Drawing
3. Electrical Motor Data
4. Typical Installation Guides
5. Technical Manuals and Parts List
6. Printed Warranty
7. Management system certificate ISO 9001

8. Manufacturer's Equipment Storage Recommendations
 9. Manufacturer's Standard Recommended Start-Up Report Form
- C. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Engineer shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined shall signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal form shall be sufficient cause for rejection of the entire submittal with no further consideration.
- D. Lack of the above requested submittal data is cause for rejection.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Referenced Standards and Guidelines:

1. Institute of Electrical and Electronic Engineers (IEEE)
 - a. IEEE 519, Guide for Harmonic Content and Control.
2. Underwriters Laboratories (as appropriate)
 - a. UL508C
 - b. UL61800-5-1
3. National Electrical Manufacturer's Association (NEMA)
 - a. ICS 7.0, AC Adjustable Speed Drives
4. International Electro-technical Commission
 - a. EN/IEC 61800-3
 - b. 2014/35/EU Low Voltage Directive
 - c. 2014/30/EU Electromagnetic compatibility (EMC)
 - d. 2006/42/EC Machinery Directive
5. National Electric Code (NEC)
 - a. NEC 430.120, Adjustable-Speed Drive Systems
6. International Building Code (IBC)

- a. IBC 2012 Seismic – referencing ASC 7-05 and ICC AC-156

B. Qualifications:

- 1. Only manufacturers with 20 or more years of experience shall be considered.

1.6 WARRANTY

- A. All equipment supplied under this specification shall be provided with a two (2) year extended warranty from the date of Substantial Completion.
- B. Warranty shall include defects in the design, material or construction of the Unit. A copy of the startup report shall be completed by Contractor and sent back to the system manufacturer and Engineer to validate the warranty.

1.7 OPERATION AND MAINTENANCE MANUALS

- A. The pump station manufacturer shall provide one (1) electronic copy and four (4) printed copies with a project specific cover, of an Operation and Maintenance Manual covering the equipment specified herein.
- B. The manual shall contain complete descriptions on operation of each item of equipment, a complete parts list with factory numbers, recommended spare parts list, and name, address, and phone numbers of nearest service center(s). Manual shall be submitted promptly following equipment delivery.

1.8 POST-BID SUBMITTALS

- E. The equipment submittal shall have a cover sheet with the name of the project and the equipment manufacturer's representative and contact information.
- F. The submittal shall include data sheets covering all individual components that make up the booster pump station and the UL file number under which the manufacturer is listed.
- G. Submittals shall include the following:
 - 10. Full size 11" x 17" mechanical drawing
 - 11. Manufacturer's warranty
 - 12. Copy of the manufacturer's UL label.
 - 13. Detailed sequence of operation.
 - 14. 11" x 17" Electrical drawings to include schematics and control panel layouts.

1.9 PUMP STATION DESIGN CRITERIA:

Booster Station	Nursing Home	Bolair
Number of Pumps	2	1
Capacity per Pump	60 GPM	60 GPM
Total Dynamic Head	300'	489'
Inlet and Outlet Size	2"	2"
Pump Speed	3,500 rpm	3,500 rpm
Motor Horsepower	7.5 HP	10 HP
Voltage	230 V	208 V
Phase	3	3
Frequency	60 Hz	60 Hz

PART 2 - PRODUCTS

2.1 VERTICAL IN-LINE MULTI-STAGE CENTRIFUGAL PUMPS

- A. All pumps shall be ANSI/NSF 61 approved for drinking water.
- B. The head-capacity curve shall have a steady decrease in head from minimum to maximum flow within the preferred operating region. The shut-off head shall be a minimum of 20% higher than the head at the best efficiency point.
- C. All pump bearings shall be of tungsten carbide construction, which includes the lower pump bearing and sleeves. They shall be lubricated by the pumped liquid.
- D. Vertical In-Line Multi-Stage Pumps shall have the following features:
 - 1. Each pump shall be designed for in-line installation requiring no more than 1.5 square feet of floor space (including motor).
 - 2. The pump impellers shall be secured directly to the pump shaft by means of a square-edge four spline shaft. This arrangement provides positive location and drive of impellers, eliminating wear.
 - 3. The suction/discharge base shall have ANSI Class 250 flange or internal pipe thread (NPT) connections as indicated in the drawings or pump schedule. Oval flange, Loose ANSI compatible flanges, Victaulic, and clamp connections shall also be available.

4. Pump Construction: all metallic wetted components in the standard 304SS construction pump shall be made of AISI 304SS or superior corrosion resistant materials; no wetted CI components are allowed.
- E. Impellers must be designed to inherently balance hydraulic axial thrust loads, thus eliminating the need for special motors equipped with bearings to manage these loads. Additionally, pumps must not be equipped with anti-friction roller bearing above the mechanical seal to manage hydraulic axially thrust loads. Impellers shall be of enclosed design and constructed of AISI 316L or AISI 304L stainless steel.
- F. The shaft seal shall be offered with two configurations; balanced and unbalanced (standard) O-ring cartridge type with the following features: the type chosen will be based on total discharge pressure as each seal configuration is designed for different pressure ranges.
 1. Collar, Drivers, spring: 316 Stainless Steel
 2. Shaft Sleeve, Gland Plate: 316 Stainless Steel
 3. Stationary Ring: Silicon Carbide
 4. Rotating Ring: Carbon
 5. O-Rings: FPM (Standard)
- G. The Silicon Carbide vs. Carbon is the ideal face combination for water application based on the PV mechanical design principles.
- H. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, shaft coupling and motor. Pumps shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.
- I. The maximum working temperature shall be 248°F. The maximum working pressure for the standard flange configuration; ANSI Flange (Class 250) shall be 360 psig.
- J. Manufacturers:
 1. The Owner and Engineer believe the following manufacturers are capable of producing equipment and products, which will satisfy the requirements of this Section. This statement, however, shall not be construed as an endorsement of a particular manufacturer's product, nor shall it be construed that a named manufacturer's standard product will comply with the requirements of this Section. It shall be the responsibility of the contractor to coordinate with the "selected" equipment manufacturer by use of this specification and all related design drawings for any necessary adjustments, modifications or alterations to standard products to ensure that the product complies with all sections of this specification.
 2. Candidate manufacturers include:
 - a. Goulds Water Technology
 - b. Grundfos
 - c. Ebarra
 - d. Engineer's approved equal.

2.2 SPARE PARTS

- A. The following spare parts shall be provided for each pump:
 - 1. One set of shaft sleeves.
 - 2. One set of mechanical gaskets.
 - 3. One set of all gaskets and O-rings.

2.3 FACTORY CERTIFIED PUMP PERFORMANCE TESTING

- A. A certified performance test shall be performed by the pump manufacturer on each pump.
- B. All tests shall be performed in accordance with the Hydraulic Institute Test Standards for Centrifugal Pumps – 1.6 (1988).
- C. Six evenly spaced test points shall be taken and shall include conditions at shut-off (zero flow) and the operating points specified herein.
- D. The engineer and/or a representative of the owner shall be given sufficient notice of the testing dates and shall have the opportunity to witness these tests.
- E. Components shall be tested for hydraulic shock, vibration, or excessive noise. Any parts found to be defective must be replaced prior to shipment.
- F. Data shall be generated showing duty point at full capacity for each pump.
- G. Test report shall be furnished to Owner upon shipment. Factory is to use current NIST traceable Flow Instruments.
- H. Copy of test to be kept on file by the manufacturer for troubleshooting references.

2.4 HYDRO-STATIC TESTING

- A. When the station plumbing is completed, the pressure piping within the station (including valves, pumps, control valves, and fittings) connections make up, the entire system shall be hydro-statically tested at a pressure not less than 150% of max system design pressure.
- B. The test pressure shall be applied for a minimum of 60 minutes, during which time all joints, connections, and seams shall be checked for leaking.
- C. Any deficiencies found shall be repaired and the system shall be re-tested at no expense to the contractor.

2.5 CHECK VALVE

- A. Size: 2-inch
- B. End Connections: CL. 250, Flanged ANSI B-16.1
- C. Pressure Rating: 400 PSI
- D. Max Temperature: 180°F
- E. Max Flow Velocity: 12 Feet Per Second
- F. Body: Iron, ASTM A-126B
- G. Seat, Plug, Bushings: Bronze, B-62
- H. Spring and Screws: 300 Series St. Steel
- I. O-Ring: Buna-N Rubber

2.6 USER INTERFACES

A. CONTROL PANEL (NURSING HOME BOOSTER STATION)

1. The duplex pump control panel shall be furnished and installed as shown on the contract drawings and specified herein. Under normal operating conditions in the "automatic" mode, the pump selected by the alternator will operate based on an adjustable timer system. The timer will provide an adjustable time period for the pump to run to fill the tank (pump on) and an adjustable time for the pump to be off. Also, the station suction pressure shall be sensed and indicate alarm conditions for "low suction pressure" from a pressure switch installed on the inlet side of the pump suction piping.
2. The panel shall include pump motor starters with adjustable overload protection, rated for the motor horsepower and voltage as shown in the pump specifications, 7.5 HP, 230 Volt, 3 Phase. Definite purpose contactors will not be accepted. The pump circuit breakers and control circuit breaker shall be furnished and mounted within the pump control panel enclosure.
3. Switches and pilot lights shall be door mounted and shall comply with Nema ratings for oil tight and watertight construction. Contact blocks on the H-O-A switches shall be rated for a minimum of 10 amps at 600-volt AC. Pilot lights shall be full voltage type with green lenses for "Pump Run" and red lens for "Low Suction Alarm". A pump alternator relay shall be furnished and installed within the panel, and include a three-position selector switch on the panel cover to allow the operator to override the alternator and manually select the lead pump in the on-off sequence (Pump #1-Pump #2-Auto). The timers shall be shall have a timing range of up to .05 to 300 hours and shall be multi-function, DPDT timed contact arrangement and have a coil voltage of 100-240 Vac.
4. The entire pump control and accessory circuitry shall be mounted within a Nema 12 dust tight enclosure with pilot lights and H-O-A switches mounted on a hinged

outer door and properly labeled with plastic engraved labels. Enclosure shall be constructed of minimum 14-gauge steel with gray enamel exterior finish. The cover shall be continuous hinge type with plated screw fastened clamps with hasp.

5. The control panel internal wiring shall be neatly installed within plastic "panduit" wireways. All wires shall be numbered at each terminal location. Wiring diagrams shall be furnished on floppy disk in the latest version of AutoCAD and contain all wire numbers and numbers of each relay or switch terminal. As-built drawings shall also include a detailed component Bill of Material.

B. PRESSURE SWITCHES AND GAUGES

1. The pressure switch controlling the pump low suction alarm shall be Mercoïd Model DA31-153 with adjustable dead band and single pole/double throw switch action in Nema 1 enclosure. The range shall be 0 to 60 psig adjustable.
2. The pressure gauges shall be a 4-1/2" face with polypropylene case, bottom connections, bronze bourdon tube and movements. The gauge shall be a Wika Model 212.34 or equal.

2.7 CONTROLLER ENCLOSURE SPECIFICATIONS

A. Type NEMA 3R enclosure:

1. Type 3R Enclosures are constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts, to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt) to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow), and that will be undamaged by the external formation of ice on the enclosure.
 - a. 0.048 In., 0.063 In. & 0.075 In. Galvanized steel.
 - b. Concealed hinges.
 - c. Spot weld construction.
 - d. Rain cap.
 - e. Mounting hole in back of enclosure.
 - f. Provisions for sub-panel.
 - g. Black quarter turn wing knob latch with padlocking provisions.
 - h. Doors open 180 degrees.
 - i. Pour in place oil & water-resistant gasket.
 - j. Ground stud on door & body.
 - k. 3/8-16 Grounding Kit.
 - l. Sub-panel mounting hardware included.
 - m. Finish ANSI-61 gray powder coating inside and out and sub-panels are powder coated white.

2.8 SPARE PARTS

- #### A. The following spare parts shall be provided for each pump:
1. One set of shaft sleeves.
 2. One set of mechanical gaskets.

3. One set of all gaskets and O-rings.
- B. The following spare parts shall be provided for the control and electrical system:
1. One complete set of all fuses.
 2. One complete set of all relays.
 3. One complete set of all bulbs.
- C. The following spare parts shall be provided for the pump station enclosure:
1. One spare set of all keys.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Equipment Mounting:
1. Install booster pumps on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."

3.2 FACTORY CERTIFIED PUMP PERFORMANCE TESTING

- B. A certified performance test shall be performed by the pump manufacturer on each pump.
- C. All tests shall be performed in accordance with the Hydraulic Institute Test Standards for Centrifugal Pumps – 1.6 (1988).
- D. Six evenly spaced test points shall be taken and shall include conditions at shut-off (zero flow) and the operating points specified herein.
- E. The engineer and/or a representative of the owner shall be given sufficient notice of the testing dates and shall have the opportunity to witness these tests.
- F. Components shall be tested for hydraulic shock, vibration, or excessive noise. Any parts found to be defective must be replaced prior to shipment.
- G. Data shall be generated showing duty point at full capacity for each pump.
- H. Test report shall be furnished to Owner upon shipment. Factory is to use current NIST traceable Flow Instruments.
- I. Copy of test to be kept on file by the manufacturer for troubleshooting references.

3.2 HYDRO-STATIC TESTING

- A. When the station plumbing is completed, the pressure piping within the station (including valves, pumps, control valves, and fittings) connections make up, the entire system shall be hydro-statically tested at a pressure not less than 150% of max system design pressure.
- B. The test pressure shall be applied for a minimum of 60 minutes, during which time all joints, connections, and seams shall be checked for leaking.
- C. Any deficiencies found shall be repaired and the system shall be re-tested at no expense to the contractor.

3.3 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Perform visual and mechanical inspection.
 - 2. Leak Test: After installation, charge booster pump and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start booster pumps to confirm proper motor rotation and booster-pump operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Pumps will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Adjust booster pumps to function smoothly and lubricate as recommended by manufacturer.
- B. Adjust pressure set points.

3.5 DEMONSTRATION

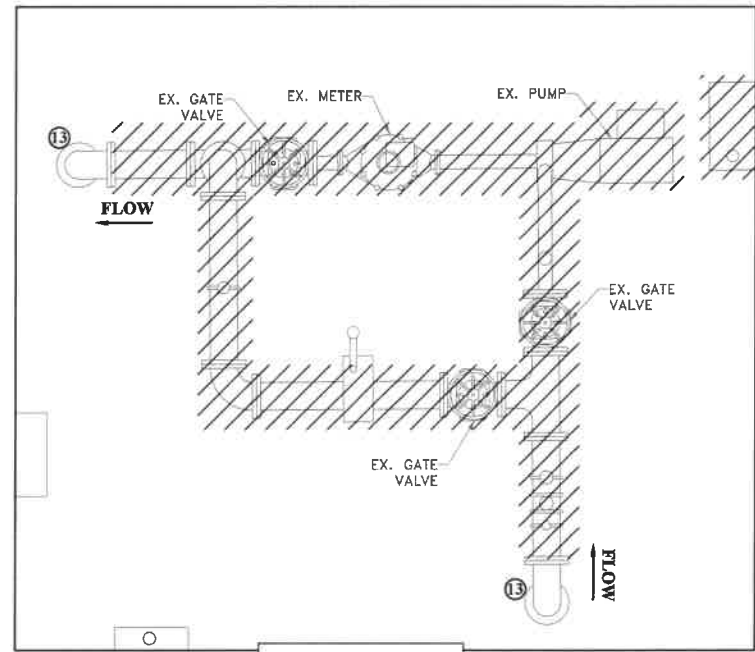
- A. After installation, pump start-up shall be performed by the Manufacturer, or authorized Manufacturer's Representative, eight (8) hours of field service shall be provided by an authorized, factory trained representative of the pump manufacturer. Services shall include, but not be limited to, inspection of the completed pump installation to ensure that it has been performed in accordance with the manufacturer's instructions and recommendations and supervision of all field-testing. The test shall demonstrate to the satisfaction of the Owner that the equipment meets all specified performance criteria, is properly installed and anchored, and operates smoothly without exceeding the full load amperage rating of the motor. The Contractor shall be responsible for coordinating the required field services with the pump manufacturer.

- B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain booster pumps.

3.6 CLOSE-OUT

- A. Contractor shall submit a copy of startup report to Engineer prior to Substantial Completion.

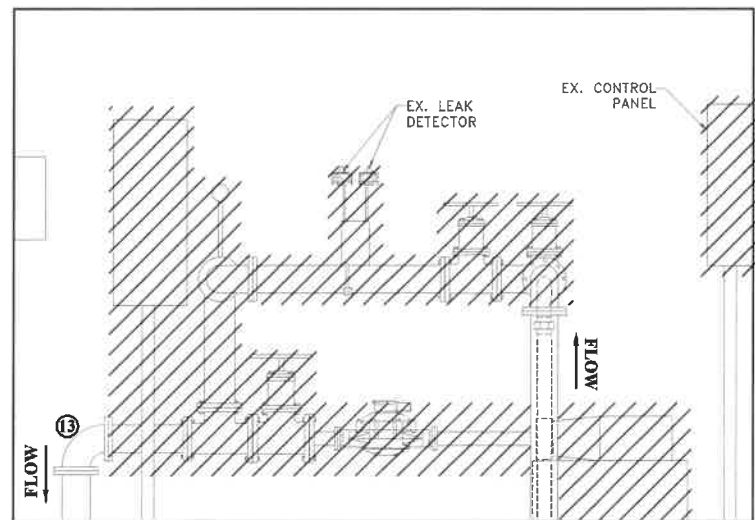
END OF SECTION 221123.13



DEMOLITION PLAN VIEW

SCALE: 3/4" = 1'-0"

////// ITEM TO BE REMOVED



DEMOLITION ELEVATION VIEW

SCALE: 3/4" = 1'-0"

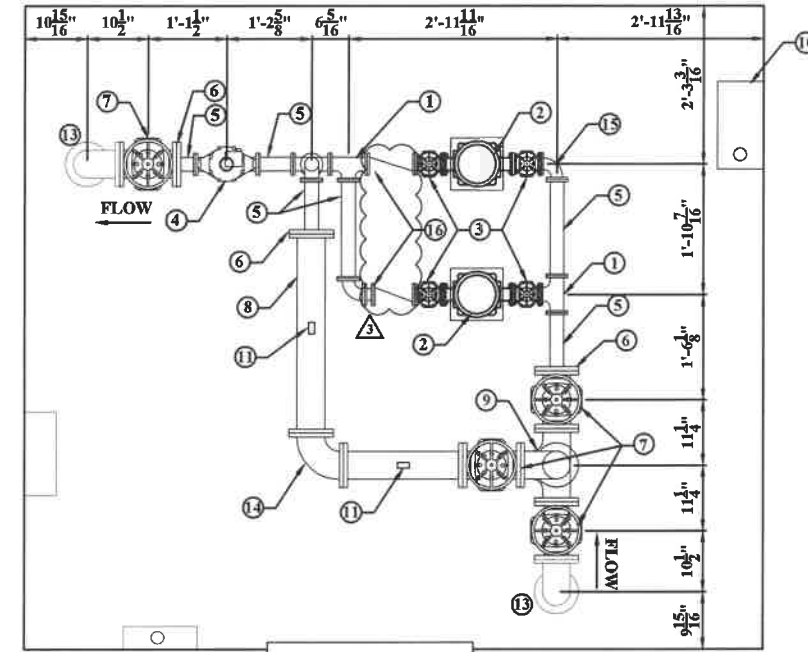
////// ITEM TO BE REMOVED

GENERAL NOTES:

- 1 ALL ITEMS SCHEDULED TO BE DISPOSED OF SHALL BE IN ACCORDANCE W/ ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
- 2 ALL CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE W/ THE CONSTRUCTION SEQUENCE OF EVENTS. SEE SPECIFICATION 011000.
- 3 TEMPORARY BYPASS PUMPING ACTIVITY SHALL BE IN ACCORDANCE WITH SPECIFICATION 330600.

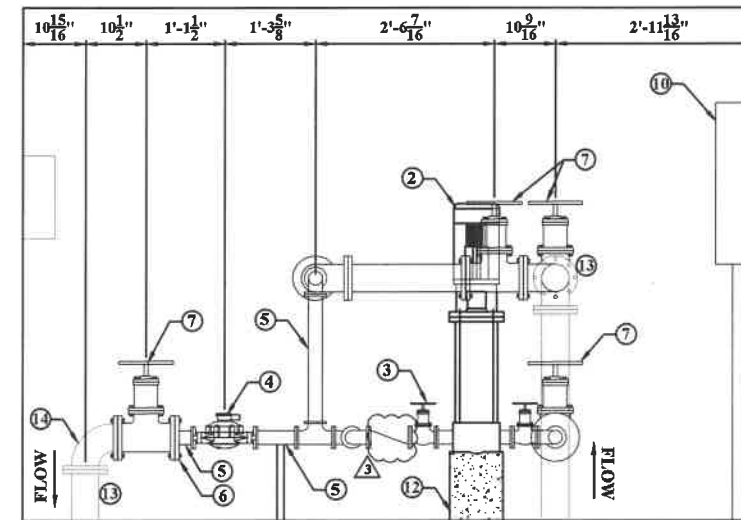
PIPING LEGEND NOTES:

- 1 2"x2"x2" BRASS FLANGED TEE
- 2 7.5 HP BOOSTER PUMP, CONNECT POWER AND CONTROL WIRING TO PROPOSED CONTROL PANEL UTILIZING EXISTING ELECTRICAL CONDUIT
- 3 2" GATE VALVE
- 4 2" FLOW METER (TO BE SUPPLIED BY OWNER)
- 5 2" BRASS PIPE
- 6 4" BLIND FLANGE W/ 2" NPT TAP
- 7 4" GATE VALVE
- 8 4" DIP
- 9 4"x4"x4" DIP FLANGED TEE
- 10 JUNCTION BOX
- 11 PIPE SUPPORT
- 12 10"x10"x12" CONCRETE PAD
- 13 ITEM TO REMAIN
- 14 4" 90° ELBOW FLANGED
- 15 2" 90° ELBOW FLANGED



REPLACEMENT PLAN VIEW

SCALE: 3/4" = 1'-0"



REPLACEMENT ELEVATION VIEW

SCALE: 3/4" = 1'-0"

ADDENDUM NO. 3

THE INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF THE THRASHER GROUP INC. REPRODUCTION OF THESE DOCUMENTS IN WHOLE OR IN PART, FOR ANY REASON WITHOUT PRIOR WRITTEN PERMISSION, IS STRICTLY PROHIBITED. COPYRIGHT © 2021 THE THRASHER GROUP INC.

NO.	BY	DATE	DESCRIPTION
1	CLW	1/25/21	ADDENDUM #3

SCALE: 3/4" = 1'-0"

DRAWN: J. FISHER	DATE: MARCH 2019
CHECKED: R. BOUSTANY	DATE: MARCH 2019
APPROVED: J. CARPENTER	DATE: MARCH 2019
SURVEY DATE:	
FIELD BOOK No.:	

THRASHER
 300 ASSOCIATION DRIVE
 CHARLESTON, WV 25311
 www.thrashereng.com

PHONE (304)-343-7601 FAX (304)-343-7604

PHASE No.	2
CONTRACT No.	1
PROJECT No.	010-0856

COWEN PUBLIC SERVICE DISTRICT
 WEBSTER COUNTY, WEST VIRGINIA
 WATER SYSTEM REHABILITATION
 PROJECT PHASE II
 NURSING HOME BOOSTER STATION DETAILS

SHEET No.	BS-2
-----------	-------------